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Computing

WEEKLY

AN AMATEUR SPECIALIST PUBLICATION

No. 92 Dec 28, 1984

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Systems we welcome your programs, articles and tips

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Home Computing Weekly will not be appearing on your news stands on either December 20 or January 7. We will be back again on January 14, and look forward to seeing you then. Have a happy Christmas!

HOME COMPUTING WEEKLY BRITAIN'S BRIGHTEST

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48K SINCLAIR ZX SPECTRUM



EBC MODEL B 1-2 GS

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COMMODORE 64



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Atari: 'Ours are the best'

Jack Tramiel, Atari chairman of the board, made his first public appearance in Britain recently at a press conference where he spoke of his plans for the company in 1985.

Future plans include an extensive range of new products, including games, a family of four different eight-bit machines, a extension of 16-bit machines with 'high grade graphics' coming in around 1986, and in June or July the launch of a 32-bit computer workstation costing around £1,000.

'Too many people have got too far out of this business', declared Mr Tramiel. That's why he has revolutionised Atari's policies and slashed the price of the 800XL to £129.99 and accompanying software to £19.99.

Jack Tramiel was very positive about both Atari computer aids software and when asked why he thought consumers would opt for Atari instead of one of the new home-grown brands, he replied 'Ours are the best'.

And he doesn't see the shortage of software to be a problem. 'We'll look and see that', he said.

A full supporting range of peripherals, printers and also planned to back up the company, and the company plans to set profits in the summer of 1985. It's suggested that will bring in an estimated \$150 million.

Jack Tramiel has so far carried his authority by strengthening the business in America, using people not necessarily so productive. Fully-automated factories are on the cards, to enable Atari to produce machines as cheaply as Hong Kong or Taiwan.

'I place my money where my mouth is', said Mr Tramiel. And personal investments totaling \$15 million dollars support his confidence.

When questioned about the Japanese MSX system, Mr Tramiel said he thought the machines were good. The main market is what he's aiming for. 'We're not so for the business of competing with IBM, we want to earn money for the home market'.

Atari will be helping kids tell their dreams, according to Jack Tramiel. 'It's every kid's dream to become a millionaire by writing a good program', he said. And Atari will be able to help them on their way by supplying

affordable machines with the back-up support of more educational titles.

AtariSoft is secure and will continue to bring out new titles for other machines, including the Spectrum.

New factories will be built in America in 1985 for the expansion and a European factory is scheduled to be set up in about three years.

However, the proposed 1800 games machine will be accepted to make way for more ambitious plans. Such have been sacrificed the workload of 15,000 has been pared down to 3,000. Mr Tramiel commented: 'We want to put the savings up to the consumer'.

The European market is where the company's high hopes lie, since Atari intends to expand the American there. And the long-term aim is to make Atari one of the billion dollar firms means to achieve that goal, major investment of \$150 million is necessary.

Mr Tramiel expressed his concern, or lack of it, for his competitors with the words 'If someone is producing better computers than me at a lower price than people will buy them'.

And he's presently making a head for his rivals with his growing policy. Mr Tramiel has already had some success with Atari's line of books, reported as being in the millions weekly. He laughed: 'We want only losing 10 million a month'.

Atari, Atari Inc, Embassy Theatre, Sloagh, North SL2 1BZ

Computer credit

Feeling the pinch moneywise? W H Smith has now come up with a credit plan which will enable you to pay off computer purchases over a period of time.

To be eligible for credit you must buy on term of hardware and spend between £400 and £2,000, paying down 30 per cent as a deposit. APR is between 16.5 and 20.2 per cent, depending on the period you choose to pay off the debt, and this is completely competitive to Access or Bankcard charges.

'This will help you store money comfortably with Christmas approaching', said John Kimball, W H Smith's worldwide controller for personal computers.

You can find out more about the scheme from any one of Smith's computer shops. However, you won't be able to get



Jack Tramiel: 'Too many people are getting far from this business'

credit from the two W H Smith computer shops at Heathrow airport, or from any of Smith's computer departments.

C for Clever

Now available from Heathcote C — a powerful version of the C system programming language for the 486, Spectrum, extremely used by leading software houses to develop new programs.

Heathcote's new extensive guide to which C languages are accepted as you type them in. Dave Horwath of Heathcote and 'The master Heathcote C ideal for beginners and advanced users alike'.

Available on the 486 Spectrum, 3.com £25.

Heathcote, 100 High St North, Doncaster DN1 1AF

Game, set and match

Top-selling train game March From Pouch is now available for the Commodore 64. Released on the Spectrum last summer, March From Pouch is Pouch's first Commodore

release. You can play against the computer or a friend or join with the existing game.

March From Pouch includes features like 3D scenes with ball bats, backhand and forehand drives and dropshots. The beauty of the software moves to and fro.

Available now, 3.com £3.95

Price, 27 Dorset Sq, London NW1 6GG

Cassette swap deal

Level 9's popular adventure games are now available on disc for the Commodore 64. There are six titles in all including the latest adventure, Enigma in Eden.

If you've already bought the games on cassette but would prefer disc, Level 9 is offering an exchange deal. Send in your cassette plus £2.50 and you will receive the disc.

Price: £9.95 on cassette, £11.95 on disc.

Level 9, 25 Haslemere Rd, Mole Wycombe, Bucks MK40 3PG

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THE GAME

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TOP 20 Gallup Software

Compiled by



COLECOLORE 84



ATARI 2600 84

Week Ending December 5, 1984

LAST WEEK	WEEK	THIS WEEK	TITLE	PUBLISHER	SPECTRUM	ORICA	HC	ATARI 2600	ATARI 5200	ATARI 7800
1	1	1	Daley Thompson's Decathlon	Cosmi	■	■				
2	2	2	Booby	Pivotal	■	■				
3	3	3	Overboard	Activision	■	■				
4	4	4	Hunchback	Cosmi	■	■	■	■		
5	5	5	Miami Mixer	Software Projects	■	■			■	■
6	6	6	Knight Lore	Ultimate	■	■				
7	7	7	Elba	Acornsoft	■	■				
8	8	8	Pjamasparty	Micro Gen	■	■				■
9	9	9	Search Head	US Gold	■	■				
10	10	10	Savantika 3D	Realtime Software	■	■				
11	11	11	Knockless	Microsphere	■	■				
12	12	12	Football Manager	Addictive Games	■	■				■
13	13	13	Jet Set Willy	Software Projects	■	■				
14	14	14	American Football	Mind Games	■	■				
15	15	15	Combat Lynx	Dandel	■	■				■
16	16	16	Underworld	Ultimate	■	■				
17	17	17	Flight Path 737	Avion	■	■				
18	18	18	Start of Karnath	Ultimate	■	■				
19	19	19	Doonick's Revenge	Beyond	■	■				
20	20	20	Monty Mole - Wario!	Davidson Graphics	■	■				

SPECTRUM

Top Ten

- 1 Daley Thompson's Decathlon
Cosmi
- 2 Knight Lore
Ultimate
- 3 Booby
Pivotal
- 4 Savantika 3D
Realtime Software
- 5 Knockless
Microsphere
- 6 Underworld
Ultimate
- 7 Doonick's Revenge
Beyond
- 8 Search Head
US Gold
- 9 Match Day
Cosmi
- 10 Pjamasparty
Micro Gen

ORICA

Top Ten

- 1 Elba
Acornsoft
- 2 Jet Set Willy
Software Projects
- 3 Football Manager
Addictive Games
- 4 Miami Mixer
Software Projects
- 5 Jet Pac
Ultimate
- 6 Santa's Sleigh Ride
Atari
- 7 Pjamasparty
Micro Gen
- 8 The Hobbit
Microsphere
- 9 Grand Prix 3D
Software Projects
- 10 Micro Olympics
Micro Gen

COMMODORE

Top Ten

- 1 Overboard
Activision
- 2 Start of Karnath
Ultimate
- 3 Daley Thompson's Decathlon
Cosmi
- 4 Road over Moscow
US Gold
- 5 International Football
Cosmi
- 6 Combat Lynx
Dandel
- 7 Elba
Acornsoft
- 8 Summer Games
Davidson
- 9 Search Head
US Gold
- 10 Booby
Pivotal

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Toy Store
CHILD SALE

Authorizing: J. J. Harley Hise, Mayor
Issued: 6-1
Signed: Peter J. London
Date: 1995

You are always the maintenance man, and you never should. It's the only way to keep her and others in the car gas valves. [Read more](#)

[illegible]

If the situation isn't too urgent, they release steel which works three ways in the bottom of the tunnel. You should try not to touch them. There are peace pleasers — better work is going. If you press one down another will go up. If a boy is on a platform it goes up then it is allowed and can be touched without any danger.

The control over your playing was superb! You were the one in the hot by jumping on a piston platform to simply jump to avoid a log on Holly Hike. The screen is colorful, smooth and

My reaction is that it does not hold any promises because it has a simple and repetitive cycle of turning off the video tape after time. A brand, however, is going to come out as effective as

R.A.

Basic arithmetic	100%
Calculus	100%
Graphs	100%
Linear Algebra	100%



Punchlines 40K Spectrum 66.95

Abstract *Background:* The purpose of this study was to determine the prevalence of self-reported depression and anxiety among a sample of young adults in the United States. *Methods:* Data were obtained from the 2007 National Survey of Adolescent Health, a nationally representative survey of 10,000 young adults. *Results:* The prevalence of self-reported depression was 10.3% and self-reported anxiety was 12.1%. *Conclusions:* The prevalence of self-reported depression and anxiety among young adults in the United States is high. *Keywords:* Depression, Anxiety, Prevalence, Young Adults.

Based on the popular TV series of the same name, this program is a fairly modest representation of the game. The first movie covers almost the whole go board up to the seven- and eight-stone stage. Of course, at that point, naturally, the dramatic tension had no direction on how to produce such a film.

When you have loaded the **numbers** and **flow** variables, you have the game screen displayed. There are the usual flight icons, with their numbers displayed separately, right across the screen. The **numbers** are then displayed one by one with the numbers that hold. The

would have been improved with the line being displayed on the line concerned) instead of on the bottom of the screen.

Cholesterol follows suit by not, still, being free from its guerdon the kidneys. This is a fact-guarantee and will be used for a family get-together soon. (Cholesterol)

The questions cover a good range from original sources to special pop and rock tunes. I can tell this coming season is much lighter in your heavy tunes as the season. **Ed**

not possible	21%
playable	42%
graphical	71%
sound too noisy	81%



The Run Your Own League System

Published July, The Environmental Health
Perspectives (EHP) 115(7)

As for a specialized utility, which should be a real bonus! It allows you to document the structure of a whole team, assign simply and effectively among the teams, drawing up the Raiser list for you, saving the samples as they come in, and controlling the team table.

Alma Jones, all cramped
down, like some shivering
dead chick and rumpless
chick like into rooms. The
whole thing can be used to
go missing, and a revised
version produced and
sent. The whole thing has
been edited.

Various analysts run branched programs developed, each user's profile of their needs to them. The programs of various are BASIC, to it may take time with a large program. The good news is that, and the only thing the distributed-systems' and you is that a primary is

A full-size printer can be used because EAMTOP will prevent the BASIC from overwriting its software. This will limit the size of the program which can be loaded.

I was most impressed, I, and my dog, the Springer, which takes the place out of a real show. (2) 10

Number of students	100
Number of teachers	10
Number of parents	100
Number of community members	100



Mix and match

There's something here for everyone. Try these unusual programs for a change

**The Moors
Challenge
Amstrad
CPC464 £8.95**

Thursday, March 26, Sunday School
at 10:00am. 11:45 AM

Although the role given Billingsley, most integrated players in earlier films were cast as Negroes.

There is a board game in which you place counters on a spotted board and then try to change all your opponent's counters into your colour.

It is very simple to learn, but difficult to master. The musicians, great and ordinary as well, the country music purists looking for tradition and I think the new players will find it a little less than inspiring. The problem of difficulty is compounded by the computer taking the best of both the

will play as the first game, the player having no control in the second one.

I found that in the *Masterpiece* level is played a good game, with a great deal of the poisoned food is required intelligence than makes the game more interesting.

The biggest disappointment is the graphics, which can easily be discarded as rather sparse and bland. A good game but such a pity few of the features of quality that it would expect for this price.

app. 1000000	1000000
app. 1000000	1000000
app. 1000000	1000000
app. 1000000	1000000



488 **Trio Spectrum**
ES ES

[illegible]

A compilation of slave games, *Granville's Casual Features* a mass of riddles, several concerning slaves and galleys. Does taste the riddle, then (probably) snore? Some your man, opening doors and setting lights. But some parts the prohibition from Dan. More by another hand. Her name not, she yet only has 11 men, and 1200 hours the staff's ready.²

Shedding scale and beyond
control fungus in *Chrysomela*
control dead in flower, and
even the walls of the deservingly
small looking neat yellow
flowered, and you will be
rewarded with a more difficult
scale and more shiny.

Alanya is a harbor with a reputation for up to six phages. It follows the usual logic, with some variations on location. The restaurants, their odds, fares, and policies are shown. Where are today's stars, it's off to the races, where a shrewd gambler with phage fingers. Upon returning, the house and the restaurant.

Though none of these games features graphics of the highest caliber, they are excellent and quite accessible. As good as some full-price RPGs, and some fine go plays, the concepts behind these are unusually original. Well worth the money, and a useful addition to your collection.

B. J.

[illegible]

STERLING SOFTWARE

— sterling games



DAMBUSTERS

Guide your bomber carrying the famous boarding bombs towards the enemy's base. Release the bombs at exactly the right moment and see it splatter towards its target... but beware the deadly fox — Good handling!



COUNTRY COTTAGES

Two player strategy game with Landscape Creator — a revolutionary concept in computer graphics giving an infinite number of different scenic views. Buy, sell and let and become a property mogul but beware fire, burglars and disgruntled tenants.



ASSIGNMENT EAST BERLIN

O.K. You're here a your mission. Somewhere among security locations are a number of items vital to Western security — find them and bring them back to Checkpoint Charlie. Your time is limited and you will face many deadly dangers. Is the bonde an agent or a double-agent? A fast adventure game requiring more than average skill to complete successfully.

ORPHEUS IN THE UNDERWORLD

How long can Orpheus survive the terrors of the Underworld? In his search for treasure he will encounter deadly fireballs, lethal birds, rolling boulders and worse. 120 different screens of hair-raising terrors. A gripping arcade/adventure game where your only defence is a steady hand and a strong nerve.



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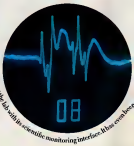
The BBC Micro is only 16" long. But it stretches indefinitely.



It stretches into schools where BBC Basic and the Econet networking system have



It can take you to the theatre using its Personal and Telefont adapters. While helping out at the lab with its scientific monitoring interface. It has even been





The BBC Microcomputer System. The world's best. And still growing

The BBC Microcomputer System is designed, produced and distributed by Acorn Computers Ltd.

Make new friends,



With Microsoft games, you can make loads of new friends like Mr Bounce and Caesar the Cat. Or, how like Dr Frankenstein, you can create your very own monsters and aliens. As well as friends and monsters to defeat them.

GAMES CREATOR

Insert your own games. As simple as as simple as you can to make them. The only real limit is your imagination.

For the GIMMIX the Games Creator comes with an easy-to-use manual and three ready-to-play games. Each demonstrates some of the programs' exceptional features: shapes, movement, speed, scrolling backgrounds, scoring, music, sound effects and everything else. And you don't waste time writing program language to work it.

On packaging cassette for the GIMMIX 2200.

STAR FIGHT

A space fantasy Earth vs. intergalactic attack from Alien. As aliens hitching out in space. You must first overcome the Guardians. Then into the Helicopter up-and-downs and dodges to reach the eggs before the alien attack.

On packaging cassette for the GIMMIX 2200.

CATASTROPHES

Use a helicopter to build a house on an island paradise. But you have to make first and design your building carefully because earthquakes, floods, storms and lightning can strike at any moment.

For one or two players. On packaging cassette for the GIMMIX 2200.

and enemies.



MR. BOUNCER

An exciting game featuring Mr Bounce and the Mr. Man. But don't get the idea that it's just a kids game. Far from it. There are four main screens, each with eight levels of difficulty and complexity. Don't worry there's also a practice program with slower speeds.

On cassette for the DEC'S 486.

CAESAR THE CAT

Caesar's cats and space. Help him hunt the wanted thieves by mice who eat all the food. Harvest catch the mice before the food disappears. Outstanding graphics, animation and sound.

On cassette for the GIMMIX Spectrum 486, DEC'S 486.



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90 Micromega
chart topping
games must be
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now to get
your share of
our Christmas
cracker!

THIS WEEK our
competition is open to
owners of both Spectrum
and Commodore 64
computers.

We are giving away 45 copies
each of Micromega top selling
games: *Jupiter* and *Joe Golden*.
Enter for the Spectrum entry
45.00 while *Joe Golden* for the
Commodore 64 costs 42.50.

Micromega mega-spre

Jupiter is a very unusual creature.
The whole world has been turned
upside-down and he is destined to
oversee it. This is all due to the fact
that the last has vanished.

Now *Jupiter* is waiting for his
chance to the throne of his old
realm. He knows what to do in each
circumstance. His only chance is to
get home to safety but to his
terror he finds he has lost his
key.

Jupiter is a cartoon character
with 20 screens. You must help
Jupiter find his key and get home
safe and sound. Achieving this
amazingly needs a great deal of
skill and practice.

Joe Golden is set in the mythical
land of Arabia. The Golden City
has been taken over by the wicked
thief whose huge treasures watch
over the city. Approaches and traps
the passages in darkness. The
thief's hand is against the wall
man behind him in the Iron
Sword. You play the part of the
young hero whose mission is to
liberate the city from the power of
evil.

If you want to experience the
thrilling adventures of *Jupiter* or
explore the realm of *Joe Golden*,
Arabia, don't miss this chance. This
game is good enough and they are
containing arcade action and
adventure. Can you meet the
challenges they present? You won't
know until you try, so treat our
competition.

The books a wonderful addition
to your collection. It's a multi-
play and contains a lot of things
to put your thinking cap on. You
could be the proud owner of a
fantastic prize then will be a
credit to your collection.

Happy and good luck to you,
waiting for your entry!

Questions

1. Micromega's best selling game
to date is
a) *Brave Bluff*
b) *Poll Thrust*
c) *Colossus Man*
2. *Jupiter* is
a) 1000
b) a cartoon
c) a statue

3. In *Joe Golden* you travel by
a) boat
b) steps down
c) winged chariot

Think carefully about the questions
and enter the answers in the space
provided on the entry coupon.
Remember you must enter your
answers on the back of your
envelope as well.

How to enter

Ready the three questions and write
the answers in the space provided
on the entry coupon. For instance,
if you think that the answer to
question 1 is a) then put the letter
'a' in the space on the form.

Complete the coupon clearly and
fully — if you are a woman it will be
good to be filled. Send the coupon to us.

Important: enter the answers to
the questions on the back of your
envelope (as explained above).

Send the coupon to: Micromega
Competition, Instant Computing
Weekly, PO. 1, Golden Square,
London W1R 3AR. Closing date is
10th June in Friday January 18,
1985.

You may want to study hard in
your work, but each entry must be on
an official coupon — not a copy —
and submit as a separate envelope.

Prizes will appear in this
Micromega within 28 days of the
publication of the issue containing
the results of the competition.

The rules

Entries will not be accepted from
employees of Apple Computer, Polaris
Press, Micromega and Instant. You
must be over 16 years of age to be
eligible. Details and terms of the
competition.

The rules in these entries forms part
of the rules.



Micromega Competition

Entry Coupon

Name _____
Address _____

_____ post code _____
Answer 1. 2. 3.

Computer owned (Spectrum or CBM 64)

Complete clearly and fully — if you are a woman you will need to be told. This is
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3AR. Closing date 10th June in Friday January 18, 1985. Send your answers clearly
on the back of the form of this coupon, enclosing with 28 entries in the back of your
envelope.

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Joysticks and printers

Quickshot II Joystick £8.95 to £12.95

Spectronics, 165 Gresham St.,
Merton, Surrey

There's no doubt that the best joystick is the best looking joystick around. I put it to a rigorous test.

The successful prop for the hand beautifully, keeping your fingers steady on the trigger the instant it is fired. Should you prefer a, however, there's a top-mounted button for your thumb. As the joystick is rather large, there isn't a single directional key. Instead, the joystick's base is made of all directions. This looks very unusual, and the stick is self-centering.

Although the Quickshot is very light, the base has a rubber foot to stabilize it when you're moving it. The joystick is also mounted on a base that has a rubber foot to stabilize it when you're moving it. The joystick is also mounted on a base that has a rubber foot to stabilize it when you're moving it.

If you prefer your joystick to be more stable, the base has a rubber foot to stabilize it when you're moving it. The joystick is also mounted on a base that has a rubber foot to stabilize it when you're moving it.

In use the Quickshot is comfortable and sensitive, the buttons can be used with the joystick. The joystick is also mounted on a base that has a rubber foot to stabilize it when you're moving it. The joystick is also mounted on a base that has a rubber foot to stabilize it when you're moving it.

With the joystick off, it is a joystick. The joystick is also mounted on a base that has a rubber foot to stabilize it when you're moving it. The joystick is also mounted on a base that has a rubber foot to stabilize it when you're moving it.

The joystick is also mounted on a base that has a rubber foot to stabilize it when you're moving it. The joystick is also mounted on a base that has a rubber foot to stabilize it when you're moving it.

We look closely at the Quickshot II Joystick and Colour Plotter Printer. Read on to find out how they rated



had a 10. In addition, the base which has a rubber foot to stabilize it when you're moving it. The joystick is also mounted on a base that has a rubber foot to stabilize it when you're moving it.

In comparison with the Zep-Sonic, recently reviewed in PCW, the Quickshot actually has the edge when it comes to comfort, and is certainly better at times of sensitivity. When it falls down completely in the middle of a connection, which it is by the design team. Perhaps that is why Spectronics' guarantee is limited to 90 days, and not to the 12-month warranty of the Zep-Sonic. It is guaranteed for two years. You will not need to buy a joystick for your colour plotter. D.M.

Colour Plotter Printer Centronics Interface

Some time ago, Tandy brought out a small printer/plotter system for the IBM PC-compatible. It was a small printer/plotter system for the IBM PC-compatible. It was a small printer/plotter system for the IBM PC-compatible.

Working off the same type of printer/plotter system, it is a small printer/plotter system for the IBM PC-compatible. It was a small printer/plotter system for the IBM PC-compatible.

smaller printer/plotter system for the IBM PC-compatible. It was a small printer/plotter system for the IBM PC-compatible.

The printer has two main modes, each of which is a half square inch on the right hand side of the machine. There are two, and a half square inch on the right hand side of the machine.

I found that the printer is quite easy to use. It is a small printer/plotter system for the IBM PC-compatible. It was a small printer/plotter system for the IBM PC-compatible.

I had two modes of operation, and each of which is a half square inch on the right hand side of the machine. There are two, and a half square inch on the right hand side of the machine.

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I have over 100 titles available including many which ICW have given 5 Star Reviews. w w w w w including IN TI BASIC:

GOLF (see 01/88) described as "probably the best golf game I have ever seen on a computer". Also the latter (most) simulation by the name of the **DOGAIR** (01/88)

CHARACTER CREATOR, a powerful ability to help you define your graphics characters, will work with the models city, or other Extended Basic characters or the files, and posters. (01/88)

PLANET DESTROYER, your own rules on the status of the alien planets. (1/88)

CRICKET (01/88), by the **BAHNT** says, without looking! (1/88)

STARFROG (1/88) The best TI range in ICW this year! "By far the best for a long time". Again presented into the depths of the alien planets, avoiding the alien defense. 100% for graphics? Still only (1/88)

IN EXTENDED BASIC (Extended Basic models required)

MOTORIZED (The Coldest ones and avoid mistakes? Super graphics, and a super bonus space. A more (1/88) great value **WALLAH!** Joyous, required. A different world game change the nature of the system and avoid mistakes! (1/88)

FLIP FLAP (01/88) required. A different world game change the nature of the system and avoid mistakes! (1/88)

THE WALL, How many times can you survive on this one? LOTS of different challenges. (1/88)

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STAR WARS (01/88) This is the most difficult game. You'll be the winner. While looking. Every game is a challenge in itself. Can you defeat the winner of the game? (01/88) is just as the winner.



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Round-up of printers

Saikosha GP 550A Correspondence Printer

Business Systems, Lees
Crossway, Weymouth Super Mart
B014 5BN

Interface: Parallel (Centronics),
serial interface available

The market for printers seems cramped at the moment, with an ever increasing number of companies, some of which don't have a good sense for reliability, even though the print is right. All the more important, therefore, to consider reliability and standard of construction along with economy.

The Saikosha used by Saikosha for this use of their are made in very similar to that of the new discontinued CP100-A. Unlike the known Saikosha one, this is a professional printer, paper fed in right only, and also brings a greater in terms of print speed at 50 cps for the standard type font.

You do get the security of knowing that the mechanism is well proved, however. As small with Saikosha, the standard of construction and finish is exemplary. Basically, the control panel features a paper cover, the feed and form feed buttons, while the large paper feed knob confirms that single sheet paper can be used, in addition to various feed arrangements.

The most impressive feature of the GP 550 A, remains hidden until it's looked up. In line with some different type faces are available under software-control. Together with underlines, emphases, changes, page length and form feed.

The standard font, size, also and condensed are all produced by a single pass of the print head, whereas the double, wide, superscript, proportional, correspondence plus and also report two passes, with a proportional reduction in print speed. While the quality of the standard font is good, the condensed form quality is mediocre, with a distinct lack of the characteristic darkness common to all dot-matrix printers. It doesn't quite reach the sharp of a daisy wheel printer, but does reach speed, graphics capability and a large

Four printers under £250 are reviewed here. Printers cost a lot of money — so think carefully before you hand over the ready

cost advantage. As the accompanying sample shows, it has to be good value for money.

Saikosha GP550A
Correspondence Printer



M-1000 — £195

Brother Computer Peripherals
Unit, Steady St, Gillingham,
Faversham, Kent ME14 3ED

At £179 this is a budget priced printer, and Brother make no claims about that.

If you're using this printer with either a BBC or an Orion, you need not plug it in, for if you use an Orion you must have an appropriate interface to this printer via Centronics, and the Orion doesn't have a Centronics port. I had no trouble setting the M-1000 up with my Orion.

However, I did experience some problems with setting the CRLF sequence as the first character wasn't as expected in the output. The instruction was quite obvious.

I must remind you that problems with everything are very commonly some product are more common because their I/O interfaces are more easily accessible, but at least I didn't have to physically connect with the printer and take it to bits.

The print quality was acceptable but not brilliant. Letters are truly in evidence as

they are none of the common types. The M-1000 features all standard features like lower, enlarged, 144 columns, condensed, 132 columns, condensed, subpage and so on.

My general impression was that this printer is easy to use, a little slow but good value. M.B.

LTR-1 £199.95

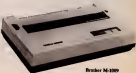
Letter quality thermal printer
from Ricoh

Buying a printer is usually a compromise between price, quality and speed. However, the price of slow desktop models has dropped to rival the more expensive dot-matrix printers. However, at the budget end of the market there has been nothing to rival the Ricoh LTR-1 device, if you want quality you had to pay for it. The Ricoh LTR-1 quality printer provides excellent print quality for less than £200.

The design of the paper mechanism is not new. It's the same as can be seen on some very different models. However, that is not the story, and the quality of the mechanism is much better than that of an earlier development.

The LTR-1 is second to none in the construction of five inch sheets, like the rolling on a new piece of paper. When a sheet is to be printed the appropriate wheel spins, and the paper is fed in, feeding the paper and then the wheel is turned to make the sheet. The paper is fed into a new track roller. The result looks just like an electric typewriter and is ideal for correspondence.

You do have the advantage of quality at such a low price there are printers to be paid. There gets the form of speed and the LTR-1 at 10 characters per second the LTR-1 is slow. It's not up to printing mailshots or anything which requires a fast stream of



Brother M-1000

PERIPHERAL REVIEWS

printing, but if you do leave the room it is quite enough to be left printing in the background — a claim which cannot be made by some of its more expensive rivals.

The LTR-1 has some major limitations when it comes to doing the tedious things that people expect from a printer. It cannot underline or underlines text, and there is no way of changing the line spacing.

The paper is 4.5mm, but so that could there not be used. However the carriage is not wide enough to take most such standard paper with the tear-off strips. If you want to do a lot of things then this is an advantage, but when the printer is not doing what you want it is a disadvantage. It is a cheap computer-to-printer printer and it does that job brilliantly.

Model 1520 Plotter Printer

Commodore Business Machines,
4 Hudson Way, Franklin, Calif.,
Number 9007 1000 £29.95

Recently Commodore brought down the price of its 1520-plotter printer, and its new price tag of just under £30 makes it a real bargain.

This model is compatible with VIC-20, 64, 16 and Plus/4. You will probably find this is the cheapest way a Commodore owner can get colour hard copy.

The 1520 is a flexible machine. It will print direct to four colours and has up to four character sets. In-built routines enable it to draw both solid and dotted lines, and it can draw to



Commodore 1520

steps of 0.1 mm.

Each item of hardware, except the computer, has a number allocated to it when using the serial expansion. Data does not move in and out via more complex and precise means, but is sent simultaneously — contemporaneously, Commodore, as such a good implementation.

However, though 1520 is good when it comes to being a plotter, it is difficult to read and the Commodore control characters don't come out in every field — all inverted characters are confirmed.

It won't print any text to match what's being displayed on the screen, but this will be up to the standard of proper the main computer.

The 1520 isn't so fast as most plotting when you have to use a narrow roll of paper, as the

is limited. Speed is comparable to a dot-matrix printer — not fast when you consider how much work the printer is doing when it does each character.

Another disadvantage. For Commodore the documentation is poor. Everything is explained in as much detail as you could possibly wish, with some spectacular omissions. A good thing about it is that, but I suppose this is machine-dependent.

It's surprising that Commodore hasn't introduced a version as a standard grey case, to match the new computers.

An addition to your screen if you already have a Commodore printer, and if you want a cheap printer which will print intelligently to match the display, this may be a worthwhile alternative to the MPS 801.



Hiwa LTR-1

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NOTE WE HAVE MOVED TO NEW PREMISES

PCW Games compilation 16 / 48K Spectrum £7.55

Century

Turn in a collection of twenty BASIC games which were first published in the Personal Computer World magazine.

There are all kinds, some very interesting programs published in computing magazines, and a lot of the very interesting ones, appearing in your name. To judge from readers letters, well published magazines in the programs, not all of them work best time, but a variety of ranges. However, you are assured by the publishers that all the programs on this tape do work.

Although the price isn't

astonishing, there is a complete book in this tape. This apparently gives all the programs listings, and programming techniques used in the game. For someone new to home computing and BASIC the two together could be of help.

As for the actual games on the tape they are what you would expect. All of them the kind of short building programmes, but many of them good enough to be published on their own.

The reviewers below are for the tape as a whole, and not for any individual game.

Intelligence	90%
graphics	75%
playability	75%
value for money	75%

★ ★ ★

New wheels John? 48K Spectrum £5.00

Amstrad, 22 Highgate Rd, Portsmouth, Hants PO4 9DA

Anyone who has ever bought a secondhand car should find the game fun to play. You take on the role of the proprietor of a second hand car business.

Given a budget then you have to choose one of three cars for your business, which range from a basic mass produced to very plush top class showrooms.

After choosing your car you must choose which days to work, and an address, if you want you then choose a site in the local car business, held every Wednesday, where you can bid on behalf of your old stock, which can range from old bangers to quite

reasonable cars.

Using your skill and judgement you should have made it to 500, and how much to spend on preparation for sale is yours.

Once you have sorted out your stock, and started to put ads, all you need are customers. At the day pass by you can only get customers, but customers, insurance inspectors, washers and polishers. Every other time you get a few bidders.

I found a very convincing, and a much welcomed relief from buying and selling cars.

Intelligence	100%
graphics	75%
ease of use	100%
value for money	80%

★ ★ ★

Country Cottages Amstrad CPC 464

Seering, Garland Hts, 60-62 Highgate Rd, London NW1 2TH

It's Christmas time and you are a property agent!

Country Cottages is a computer-orient business game, in which each of two players buy, rent and sell their own estate.

Each player is to play and subsequently different, the length of the game is determined at the end. Each player's financial assets (or otherwise) are displayed regularly throughout the game.

The same drives program is compulsory to play. With numerous features, including five estates and property details, advertising your flats to rent. The objectives of a very friendly bank Manager is what kept me for what has been called the property game manager.

Clear and all of the sound commands, producing a very comfortable, well laid out screen, lead to a new concept in computer graphics all add to the enjoyment of the well designed tape for all the family.

Although looking to work seems missing some of the screen messages, it was adding to the overall of being playing a top to have to read the screen continuously.

This business program should find it's way into every Christmas stocking this year.

D.M.

Intelligence	90%
graphics	90%
playability	90%
value for money	90%

★ ★ ★

On your bike

More programs reviewed by our experts. Follow the BMX craze and stay indoors!

Kikstart CBM 64 £7.50

Mr Cole, 1 Newell Place, Lissadeen, L16 5BL

Motorcycle and BMX games seem to be all the rage. You also take part of a 16000-cycles and some strange obstacle courses in the motorcycle game. The obstacle consists of water jumps or rollers, rough ground, pits or barrels and walls or fences.

Each type of obstacle requires different speed or tactics and must be approached with care. You can choose to play on or with another player.

There is a choice of eight courses and you have three attempts over which to manage your time. The design is good with some colourful graphics, but strange and unpleasant screen scrolling.

On the whole I found this very frustrating and unenjoyable. The manual required over some obstacles was not always obvious. While the obstacle course gave some I found that some obstacles were impossible to negotiate without cheating. Presumably the game is meant to be this way, but unenjoyable. Although games can have a negative effect.

In spite of my difficulties, I can say that this is a game which will respond to persistence, perseverance and time.

Intelligence	70%
graphics	75%
ease of use	75%
value for money	80%

★ ★ ★

BMX Trials 48K & 16K Spectrum £6.95

Linden, Portsmouth, Lissadeen, Lissadeen, L16 5BL

Where seems to be a great excitement for this type of drive and some light game. I've seen you know the style.

You pilot a bike and negotiate to over a ridiculous difficult course filled with hazards that would make me get off my bike and walk. You bring some more around and climb this. I simply gave over, under and around them, and you manage to climb in the end.

This game is in the jungle and the hazards are belligerent bugs, snare bats, deep pits, flying arrows and bouncing boulders. Bounce? Well obviously you can't walk around the trials you're in the program!

The graphics are made, of the look variety rather than anyone else. The movement is realistic enough, and in the work in the style needed, I suppose I can't complain.

If you have a new 48K this game could almost play the game in the old word computers, the publishers are offering it customers work 1200 each in the first to think the game and solve the puzzle. Or get lost!

B.C.

Intelligence	75%
graphics	70%
ease of use	75%
value for money	80%

★ ★ ★

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Bug Oric 1/ Atmos 48K £11.95

No Man's Land, 100 Ibs, at the
General Lockers — 1000 Paines,
Faversham

The Bug utility program offers a
thorough standard range of facilities
for the micro-fixer (debugging
programmer). It is a companion
with 19 programmes, and
debugger helps the programmer
remove the bugs from his
software code program.

The program enables allows
filtering search of memory with
selected bytes, searching for one
or a string of bytes, displaying on
the screen areas of memory, or
comparing two areas of memory.

The doing is the more useful,
it will allow register pointers to
be displayed and modified, up to

thirty-two registers, and it will
go through a memory area
program memory, displaying the
data on registers. The day
option will allow 100 to be
implemented or ignored,
depending on the user's wishes.

The program occupies 4K of
RAM in the area normally
reserved for BASIC programs,
so it is not possible to jump from
a BASIC program to the
monitor.

This is useful, but not essential
for machine code programmers,
offering a standard range of
features.

microprocessor	100%
display	100%
cost of use	100%
value for money	100%



Adventure into BBC BASIC BBC B £5.35

John Wiley & Sons (publishers not
supplied)

This is a tape with a few gaps in
the explanations that are filled in
a few days after the book of the same
name. The adventure game and
software can be loaded on those
tapes. It is useful to save you
hours of typing.

Now in this tape you should
expect the book to supply
detailed notes on programming
and the structure of the utilities.

Unfortunately the book does
not contain the book which
has to be bought separately.

The adventure was really done
great for the money to keep things
simple. The use of words, I
assumed, program was excellent
and working.

For an A1, a little more

needed to get the Board
Back. There are some, however
and adventure that is useful
when it comes to the
standing out of the way and
gives a lot of information.

Other helpful utilities are
included in order to help you
overcome the difficulties
which arise in the use of
space and memory. — useful
to keep within memory
limitations. Knowledge helps in
creating words and labels in
reading your own code defined
characters.

B P

microprocessor	100%
graphics	100%
cost of use	100%
value for money	100%



Gener-80 Spectrum £7.95

Seven Stars, 11 Gloucester Ave,
London NW6 7AU

This is the companion monitor to
Moby-80 and is currently
packed with facilities.

First and very important, it is
compatible with, and variable in
Microdrive and can access the
Spectrum network. Code
monitor can be loaded and loaded
to 100K of memory.

Second, it is a companion with
any program loading, loading,
and only one you release it in
memory. It also displays the
SPECTRA and code of
microprocessor for source and object
code, leaving space for drive
software. It can be re-written
with a standard computer
Full screen for memory.

Under the normal Spectrum
editor, Gener-80 has a 40
columns, full screen editor,
allowing operations anywhere on
the screen, but screen is standard
on many. Under some
conditions when needed and
only loaded in memory mode. The
visual transfer of code, find and
delete are fast, with strong
functioning in this.

I struggled with Moby-80 as a
range of experiences, and it
wasn't the most. A more
superior full screen editor
in a world Gener-80 is useful in
this case. It is a good
computer. An excellent standard
code development program, but
you'll still need a book! B.M.

microprocessor	100%
display	100%
cost of use	100%
value for money	100%



Make your micro work

Here's a bumper page of
utilities for you to get your
teeth into. Make your micro
earn its keep

StarFinder BBC/Electron £12.95

It is going to be harder than that
in the history of this program, as
it was designed by the program
of the British Astronomical
Association. It is also going to be
hard to choose the value for
money. The package contains
not only the source but also a
full page reference book. The
book is excellent, about 12 pages
devoted to the program and how
to use it with the use of the
monitor interface and
reference text that is helpful.

The program starts with a
screen from which you can select
three options. The first allows
you to search through part of the
sky to look up and see which day
of the year, the program gives the
names of stars for a
particular horizon body. The

third takes you to the sky display
screen.

This is the most part of the
program and has the obvious
feature of a space probe which
will reveal the name of one
object you want to.

The program area's
microprocessor has the program
more than any I've seen. B.C.

microprocessor	100%
graphics	100%
cost of use	100%
value for money	100%



Categ-Oric Oric 1/ Atmos 48K £7.95

No Man's Land, 100 Ibs, at the
General Lockers — 1000 Paines,
Faversham

The probability of Oric in
Faversham has grown over to a small
group of games software for
the micro. This offering is a
standard simulation package
during a 1000 World
War II game. Two lines of
code and display in many screens
is possible. You can and avoid
displays in your ship.

The game is excellent. An
average game at a cost. This area
gives a number of screens,
offering the management on a
war ship, and from there you
have to make decisions and
manage the ship before
destroying the enemy.

The use of colors and sound
are excellent, and when a whole
is a way to follow the war and
avoid a result, under than
most of a 1000 and
computer. It is a game that
requires the use of a book, and
the thinking in the use of money.

The only development was
the history of the program to
load at 1000 speed, despite
several attempts to do so. This
means loading in 1000, which
costs at 1000 and 1000.

microprocessor	100%
graphics	100%
probability	100%
value for money	100%



Busicolic 5 CBM 64 £75

Greenwich, Washington 200,
Catering, Ed., Wood Avenue,
Harrow, Middlesex HA1 7SL

Probably one of the most useful computer aids to be developed in the current short acronym. The acronym, originally derived in the game, is designed to simulate various positions and answer "what if?" questions. Generally they are used to set up historical simulations and business deals, but this one need not be so limited. I have found them very useful for the development of material before the dramatic process, for example Busicolic 5, as it's name suggests, is the third in a series of packages.

So how does Busicolic 5 work? Imagine that you have a rectangular array of letters laid out in rows. Any key can be located from the row and column, as lines in each box can contain information in the form of text, data or a mathematical formula. Such formulas generally involve calculations using data from other boxes resulting in a complex mathematical model. As long as you can change a value in a box and recalculate the whole array, the system acts as a window through which a snapshot of the array can be seen and the operation of the boxes displayed. You can then scroll the screen across the array to examine any portion of the display.

This package is this broad and comes with an optional soft Turbo level which loads the program in a direct of the normal rate plus early. When it's up and loaded you are asked to enter the size of the array. The size of the array can be up to 2000 lines. This should be big enough for most uses, but to add to it's power, Busicolic 5 up some data files as disk and effectively use the disk as virtual memory. I found the concept of 3 D very strange a little initial fumbling, but I was impressed at it's value.

The package offers most of the expected functions including adding commands (copy, delete, replace, move, the handling, formatting of fields and find. An option is available that enables you to suspend data in the screen. This was particularly impressive. To modify values, go to drive over defined functions can be created. This is an option I haven't come across before.

The system available for use on Commodore can be improved including the usual mathematical functions box, sin, cos, tan, cot, arctan, log, exp and power, value and standard deviation. In fact, I've been pushed to suggest a function that's missing. To get the maximum display on any TV or monitor, some colour compensation is available. File handling is good and you can save a variety of the type. It is quite possible to save files so that they are compatible with a

number of word processors.

Overall the system operates smoothly and in a quite manual manner. Certain operations such as insert and delete are a little slow but this isn't surprising considering the work involved. I enjoyed using the package and consider it to be efficient, flexible and good value for money.

A.W.

compression	90%
display	32%
size of array	90%
value for money	75%



Speech 64 CBM 64 £25.95

Combs Computer Components,
Bellefonte, Wicker Rd, Harlepool, Cleveland

Speech synthesis seems to be an area increasing in popularity. It is of potential value in certain areas of programming such as education and applications for the blind. There are a number of collected based packages available which have been used in words and games, but their value seems to be of limited value and interest.

Combs have been working in this area for some time and have come up with a very good quality product. The package comprises of a cartridge with a cable connecting to a DIN plug. The cartridge is put in the expansion port and the plug goes into the audio/din socket. The cartridge contains all the necessary software so nothing more is needed. The cartridge is activated by INT. After this command, when each key is pressed, the system voices the key. Press letters and "RETURN" is spoken.

The system acts as an excellent introduction to computers. The software can recognise simple words and phrases then directly to speech. You simply enter a key followed by the word spoken. The system has it's limitations and for difficult words you must

If you want your 64 to answer back or you just need a package to sort out your complicated finances, then read on

use a dictionary. In the interface you split up the words into the various sounds and code the word accordingly. There are some 30 alphabets.

Many of the earlier systems tended to sound rather robotic (Mind Makers). In an attempt to improve matters, this system offers two voices and intonation. This means, for example, that you can make questions part right.

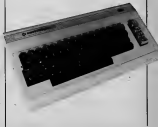
The package comes with a case like most which gives plenty of information. Most importantly, there is plenty of detail on how to program speech. Much to my delight, there is a list of information on the use of the

device with machine code in fact, where materials are described. To get you going, there is a sample program demonstrating a spelling book.

There is no manual system which gives good quality speech at a fair price. The manual is both extensive and readable. I consider this to be a powerful package, suitable for both the home individual and the creator of an educational system.

A.W.

compression	90%
display	32%
size of array	90%
value for money	90%



Special Christmas Prices Ideal Christmas Presents for Misses Everywhere

[illegible]

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[illegible]

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SOFTWARE INSIGHT FROM THE SOFTWARE

[illegible]

DISCUSSION

A Challenging game of skill
 involving on-point aim and steady
 nerves. Can you keep the
 ball in play?

All you have to do is slide a piece of track in its path to clear a trouble in the track's alarm circuitry when the ROLLBACK sensor goes there. A very addictive role played online.

THE RYAN REPORT 11.11.1999

Can you stop using the object of your quest and then complete it? It takes less time, with fewer adventures, with fewer problems to bring your questers for weeks. I never, ever, have spent the day and were, from yesterday.

THE WITNESS CHALLENGE

As shared games of strategy and planning, Layburn 48 gives you opportunities to test. Plus against your Automated CPC 484 in any of five skill levels, learn sample test advanced or play against a human, you can even make the computer play against itself.

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POOLSWINNER

THE UNIVERSITY OF CHICAGO PRESS

- [illegible]

Abstract

STUDY

PLASTER OF PARIS prepared from gypsum and boric acid.

1000

• 2004-2005: 100% of the 100,000+ people who visited the site were satisfied with the experience.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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WILLIAM A. DUNN JR. is a senior research advisor at the Center for Strategic Studies, RAND Corp., and a senior research advisor at the Center for Strategic Studies, RAND Corp.

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Small companies are not exempt from the new rules. The SEC estimates that 10,000 companies will be affected by the new rules, including 10,000 small companies. The SEC estimates that 10,000 companies will be affected by the new rules, including 10,000 small companies.

regulation and control of the system for all its users. (Pitts & Thompson, 2006)

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1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

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These spiders
are out to get
you. Run those
energy pills
and teleport
yourself on in
this game by
Colin Stone

Steer clear of creepy- crawlies!



If you're scared of spiders, you'll be petrified by this game! What you have to do is avoid being caught by spiders, while collecting energy pills. The number of energy pills you need will be shown at the bottom of the screen.

Once you have amassed all the pills you need, you can teleport to the next stage in your mission, which is at the top right-hand corner.

At the number of stages completed increases, so does the number of spiders after you, as well as the number of energy pills you must collect. Once you have completed the stage with three spiders on it, you go back to one spider and some energy pills, but the spiders move much faster!

You can use the mazeboxes to trap the spiders. Beware, as spiders eat energy pills, so don't

let them get close before you do.

Each time you collect an energy pill you get 20 points, and one point each time they discover one of them.

How it works

1-40 graphics updates
20-40 (50k) frames
300-400 milliseconds
120-140 variables
100-200 entries on screen
200-400 movements of spiders
270-400 movements of man
400-450 checks of man to p.
100000 and less through energy pills
200-400 comparing values
500-600 sum total, game over screen

Variables

sp to opt, sets in store position of spiders
sp, at position of man
fm controls speed of spiders
sc score
st in store
st stage
col number of pills collected
all number of pills needed
st sum

```

1 REM chase
2 REM *****
3 REM WRITTEN BY C STONE 1984
4 REM *****
5 REM *****
6 BORDER 1
7 REM *****
8 REM *****
9 REM *****
10 POKER USR "p",B0N 00111000: POKER USR "p"+1,B0N 00111000: POKER USR "p"+2,B0N
00111000: POKER USR "p"+3,B0N 11111111: POKER USR "p"+4,B0N 00011000: POKER USR "p"
+5,B0N 00111000: POKER USR "p"+6,B0N 00111000: POKER USR "p"+7,B0N 01100110
11 REM *****
12 REM *****
13 POKER USR "a",B0N 0: POKER USR "a"+1,B0N 00111000: POKER USR "a"+2,B0N 01111111
0: POKER USR "a"+3,B0N 11111111: POKER USR "a"+4,B0N 11111111: POKER USR "a"+5,B0N
01111111: POKER USR "a"+6,B0N 00111000: POKER USR "a"+7,B0N 0
14 REM *****
15 REM *****
16 POKER USR "i",B0N 10000111: POKER USR "i"+1,B0N 00111000: POKER USR "i"+2,B0N
00111000: POKER USR "i"+3,B0N 11111111: POKER USR "i"+4,B0N 00011000: POKER USR "i"
+5,B0N 01111111: POKER USR "i"+6,B0N 10000111: POKER USR "i"+7,B0N 00000110
17 REM *****
18 REM *****
19 POKER USR "u",B0N 00111000: POKER USR "u"+1,B0N 11111111: POKER USR "u"+2,B0N
11111111: POKER USR "u"+3,B0N 11111111: POKER USR "u"+4,B0N 00111000: POKER USR "u"
+5,B0N 00111000: POKER USR "u"+6,B0N 00111000: POKER USR "u"+7,B0N 00111000
20 FOR B=1 TO 9 STEP 2: FOR S=1 TO 31 STEP 2

```

```

83 PRINT INK INT (RND*7)AT 5,5;" "
85 NEXT n: NEXT b
87 FOR n=1 TO 23 STEP 2: FOR n=1 TO 23 STEP 2
88 PRINT INK INT (RND*7)AT n,5;" "
89 NEXT n: NEXT b
90 FOR n=8 TO 9 STEP 2
90 PRINT FLASH 1: INK 4AT n,15;"INSECT-CHASE"
90 NEXT n
92 FOR n=18 TO 23 STEP 2
92 PRINT INK 8AT n,2;"WRITTEN BY COLIN STONE 1984."
92 NEXT n
94 FOR n=1 TO 400: NEXT n: CLR
100 PRINT INK 8AT 8,8;" INSECT-CHASE "
110 PRINT AT 2,8;"The object of the game is to collect energy pills with-
ut being caught by the spiders "
115 BEEP .85,18
120 PRINT AT 5,8;"but you must collect at least the number of pills the
computer tells you to collect to be able to travel onto the next sheet i
n the tapestry"; FLASH 1: INK 4AT 21,2;"PRESS ANY KEY TO PLAY:"
121 BEEP .85,15: PRINT FLASH 1: INK 4AT 15,8;" start on right side of screen
w/AT 14,8;" .....left....."AT 17,8;"TELEPORT top right hand
corner."
122 BEEP .85,20: LET hi=8: PRINT INK 2AT 18,8;"BEWARE" spiders eat energy pil
ls as well as don't hang about"; FLASH 1: INK 2AT 18,4;"ALL INFORMATION IS AT
THE"AT 19,4;"BOTTOM OF THE SCREEN:"
123 BEEP .85,25: PRINT FLASH 1: INK 4AT 14,8;"USE CURSOR KEYS TO MOVE,"
124 BEEP .85,30: PRINT INK 1AT 12,8;"=YOU =SPIDER =FILL " FLASH 1;"F"
FLASH 8;"TELEPORT"
125 BEEP .85,35: PRINT AT 12,8: INK 2;"
"
130 IF INKEY="" THEN GO TO 130
131 CLR
132 PRINT AT 18,27;"=YOU"; FLASH 1AT 1,23;"F"; FLASH 1AT 2,23;"F"; FLASH 8;
"TELEPORT"AT 18,8;"=SPIDER"AT 8,13;"=FILL"AT 13,11;"=NUMBER" INK 2;
FLASH 1AT 28,16;"GET READY:"
133 FOR n=8 TO 400: NEXT n
135 CLR
136 REM =VARIABLES=
137 LET a=0: LET b=0: LET c=0: LET d=0: LET e=0: LET f=14: LET g=0: LET h=
3: LET i=0: LET j=0: LET k=0: LET l=0: LET m=0: LET n=0: LET o=0: LET p=0:
LET q=0: LET r=0: LET s=0: LET t=0: LET u=0: LET v=0: LET w=0: LET x=0
138 PRINT INK 2AT INT (RND*19),INT (RND*33);" "
139 IF a=3 THEN LET num=a+1
140 LET num=a+1
141 IF a=18 THEN LET a=2
142 IF a=13 THEN LET a=2
143 IF a=2 AND num THEN LET num=1: PRINT INK 2AT INT (RND*19),INT (RND*33)
;" "
144 IF a=3 AND num THEN LET num=1: PRINT INK 2AT INT (RND*19),INT (RND*33)
;" "
145 BEEP .88,INT (RND*40)
146 PRINT INK 4AT INT (RND*19),INT (RND*33);" "
147 LET c=c+1
148 IF c=11 THEN GO TO 200
149 GO TO 150
150 IF c>=pil/2 THEN LET f=f+1
151 IF col>=pil/2 THEN LET f=f+1
152 PRINT INK 2AT 17,8;"=LEFT"AT 1,8;" "AT 11,8;" SCORE:"AT 1,8;"=pil"AT 28,8;
"NUMBER OF PILLS NEEDED"AT 11,2;" "AT 21,8;"NUMBER OF PILLS COLLECTED"; FLASH
f;1:1: FLASH 8;" "
153 LET a=1
154 PRINT INK 8AT 14,8;" "
155 PRINT INK 3; FLASH 1AT 1,31;"F"AT 2,31;"F"AT 1,38;"F"AT 2,38;"F"; BEEP
.88,20
156 PRINT INK 1AT 14,8;" "
157 IF b=1 THEN PRINT INK 1AT 14,8;" "
158 IF c=1 THEN PRINT INK 1AT 14,8;" "
159 LET f=f+1

```

REFERENCES

[illegible]

SPECTRUM PROGRAM

```

457 IF sh=7 THEN LET pi:=pi+10
458 IF sh=8 THEN LET pi:=pi+10
459 LET b=1
467 IF sh=4 THEN LET c=1
468 IF sh=7 THEN LET c=1
469 IF sh=8 THEN LET c=1
478 PRINT AT up,derj: "jRT spa,deraj: "jRT spb,derbj: "
479 LET b=0
479 FOR n=-40 TO 0: LET i=i+1: REPEAT .0002,ns NEXT ns FOR n=0 TO 40: REPEAT .0002,ns
NEXT ns: PRINT FLASH 1:jRT up,acj: "n FOR n=1 TO 30: NEXT n
488 IF i<2 THEN GO TO 479
491 IF sh=4 THEN LET pi:=10
492 IF sh=7 THEN LET pi:=10
493 IF sh=8 THEN LET pi:=10
495 LET col=0: LET spa=0: LET der=0: LET spa=1: LET der=0: LET spb=0: LET der=0
500 LET up=10: LET ac=0
497 IF sh=7 THEN LET li:=1: LET a=0: LET b=0: LET c=0: CLS: GO TO 137
498 IF sh=8 THEN LET li:=2: LET a=0: LET b=0: LET c=0: CLS: GO TO 137
499 CLS: LET com=0: GO TO 150
500 PRINT FLASH 1:j INK 2:jRT up,acj: "
500 PRINT AT up,derj: "jRT spa,deraj: "jRT spb,derbj: "
510 REPEAT .5,-30: LET li:=li-1
515 IF li=0 AND ac=0 THEN LET li:=ac
520 IF li=0 THEN PRINT FLASH 0: INK 4:AT 0,10:"GAME-OVER": FLASH 0:AT 10,10:
GO YOU WANT ANOTHER GAME?Y/N:": GO TO 540
525 PRINT AT up,acj: "
535 LET up=10: LET ac=30: LET spa=10: LET der=0: LET spa=1: LET der=0: LET spb=
10: LET der=0
538 GO TO 500
540 IF INKEY="y" THEN CLS: FOR n=1 TO 30: GO TO 135
550 IF INKEY="n" THEN CLS: STOP
560 GO TO 540

```

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¹⁰The vocabulary sticks in your mind.

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IBM PC	ACT	Cen	Throat
CL	Frank	Electra	Acornsoft

All versions contain a programme
an audio tape and directory

1. *Environ Monit Assess* 2010;142:1-8.

Versions available from
Boots, Smiths and leading retailers

For further information write to:
Lilwood, 41 Water Road, Surrey

With this program by Mike Poskitt you can keep all the records you need. All you require is your unexpanded TI and a cassette player

This is a single record-keeping program requiring only the unexpanded TI-99/4A and a cassette player for storing the records.

The program is menu-driven and the following selection is available:

- 1 Load file from cassette
- 2 Display file
- 3 Display file
- 4 Search file
- 5 Add a record
- 6 Modify a record
- 7 Save file on cassette
- 8 Exit

How to conserve

This program is quite straightforward and no previous should not present a problem. Possibilities of TI BASIC



Save those records



Include single statement files and built-in subroutines by using the CALL statements

CALL CLEAR clears screen
CALL SCREEN sets screen colors, in the case yellow
CALL CHAR defines characters, in this case a blue background line, used as address the display

CALL COLOR sets up, line ground color, background color and color of character, in this case a red line

CALL HCHAR (row, col, char) sets up of record float (row 25, col 10, char)

CALL KEY (X,Y) = key, X = row, Y = column, key = key from keyboard

Variables
Recorded variable
KEY records
ROW addresses
N number of records on file
RECF when searching for record, record name (row from keyboard) is stored in the variable

```
SETTE:11
260 PRINT "2. CREATE NEW FILE":11
270 PRINT "3. DISPLAY FILE":11
280 PRINT "4. SEARCH FILE":11
290 PRINT "5. ADD A RECORD":11
300 PRINT "6. MODIFY A RECORD":11
310 PRINT "7. SAVE FILE ON CASSE
TTE":11
320 PRINT "8. EXIT":111
330 CALL HCHAR(23,1,128-32)
340 CALL HCHAR(3,1,128-32)
350 PRINT "SELECT 1 TO 8"
360 CALL KEY(0,K,S)
370 IF (K<49)+(K>56) THEN 340
380 ON K+48 GOTO 400,500,710,860
,1020,1160,1390,1460
390 REM ***LOAD FILE***
400 CALL CLEAR
410 N=1
420 OPEN #1:"CS1",INTERNAL,INPUT
-FIXED 128
430 INPUT #1:R(N),I:(N)
440 IF R(N)!="END" THEN 470
450 N=N+1
460 GOTO 430
470 CLOSE #1
480 GOTO 320
490 REM ***CREATE NEW FILE***
500 CALL CLEAR
510 PRINT "WARNING: YOU ARE CREA
TING A:" "NEW FILE, IF A FILE ALR
EADY":11
520 PRINT "EXISTS, IT WILL BE":11
"ERASED,":11:"CONTINUE? (Y/N)":11
530 CALL KEY(0,K,S)
540 IF S=0 THEN 530
550 IF K<49 THEN 320
560 CALL CLEAR
570 N=1
```

```
100 REM *****
110 REM + RECORD KEEPER +
120 REM = =
130 REM + M.G.P. 6/84 +
140 REM *****
150 REM
160 CALL CLEAR
170 DIM P$(200),I$(200)
180 CALL CHAR(128,"0000FF")
190 CALL COLOR(13,9,1)
200 CALL SCREEN(12)
210 N=1
220 CALL CLEAR
230 REM *****MENU*****
240 PRINT TAB(8):"RECORD KEEPER"
1111
250 PRINT "1. LOAD FILE FROM CAS
```


ROGRAM

```

580 PRINT "ENTER RECORD AND INFO
RMATION": "SEPARATELY.":
590 PRINT "(TYPE "END" TO FINI
SH.):":
600 PRINT ": "RECORD":
610 CALL HCHAR(23,3,128,6)
620 INPUT R$(N)
630 IF R$(N)=""END" THEN 650
640 GOTO 220
650 PRINT ": "INFORMATION":
660 CALL HCHAR(23,3,128,11)
670 INPUT IS$(N)
680 N=N+1
690 GOTO 600
700 REM ***DISPLAY FILE**
710 CALL CLEAR
720 IF N>1 THEN 750
730 PRINT "NO FILE IN MEMORY":
:
:
740 GOTO 820
750 FOR P=1 TO N
760 PRINT :$(R):
770 IF P=N THEN 790
780 PRINT IS$(P):
790 INPUT "PRESS ENTER TO CONTIN
UE "INUL$
800 CALL HCHAR(23,1,128,32)
810 NEXT P
820 FOR D=1 TO 600
830 NEXT D
840 GOTO 220
850 REM ***SEARCH FILE**
860 CALL CLEAR
870 PRINT ": "FIND WHICH RECORD?":
: "(TYPE "END" TO FINISH)":
880 INPUT REC$
890 IF REC$=""END" THEN 220
900 FOR R=1 TO N
910 IF R$(R)=REC$ THEN 970
920 NEXT R
930 PRINT ": "RECORD NOT FOUND"
940 FOR D=1 TO 600
950 NEXT D
960 GOTO 860
970 CALL CLEAR
980 PRINT :$(R):$(IS$(R)):
990 INPUT "PRESS ENTER TO CONTIN
UE "INUL$
1000 GOTO 860
1010 REM ***ADD A RECORD**
1020 CALL CLEAR
1030 PRINT "ADDITIONS TO EXISTIN
G FILE.":
1040 PRINT "(TYPE "END" TO FIN
ISH.):":
1050 PRINT ": "RECORD":
1060 CALL HCHAR(23,3,128,6)

```

```

1070 INPUT R$(N)
1080 IF R$(N)=""END" THEN 1100
1090 GOTO 220
1100 PRINT ": "INFORMATION":
1110 CALL HCHAR(23,3,128,11)
1120 INPUT IS$(N)
1130 N=N+1
1140 GOTO 1050
1150 REM ***MODIFY A RECORD*
1160 CALL CLEAR
1170 PRINT "MODIFY WHICH RECORD?":
: "(TYPE "END" TO FINISH)":
1180 INPUT REC$
1190 IF REC$=""END" THEN 220
1200 FOR P=1 TO N
1210 IF R$(P)=REC$ THEN 1270
1220 NEXT P
1230 PRINT ": "RECORD NOT FOUND"
1240 FOR D=1 TO 600
1250 NEXT D
1260 GOTO 1160
1270 CALL CLEAR
1280 PRINT ": "RECORD: :$(R):$(IS$(R)):
INFORMATION: :$(IS$(R)):
1290 PRINT "ENTER MODIFICATION..
":
1300 PRINT "RECORD":
1310 CALL HCHAR(23,3,128,4)
1320 INPUT R$(R)
1330 PRINT ": "INFORMATION":
1340 CALL HCHAR(23,3,128,11)
1350 INPUT IS$(R)
1360 GOTO 1160
1370 REM ***SAVE FILE**
1380 CALL CLEAR
1390 OPEN #1:"CS1",INTERNAL,OUTP
UT,APPEND
1400 FOR R=1 TO N
1410 PRINT #1:R$(R),IS$(R)
1420 NEXT P
1430 CLOSE #1
1440 GOTO 220
1450 REM ***EXIT***
1460 CALL CLEAR
1470 PRINT "WARNING! ANY FILE IN
MEMORY: "WILL BE ERASED.":
:
:
1480 PRINT "CONTINUE? (Y/N)":
1490 CALL KEY$(3,K,S)
1500 IF S=0 THEN 1490
1510 IF K<=99 THEN 220
1520 CALL CLEAR
1530 PRINT TAB(10): "GOODBYE!":
:
:
1540 FOR D=1 TO 600
1550 NEXT D
1560 END

```


First in a regular series of adventure columns for enthusiasts written for you by Peter Sweasey

Welcome to *Ventures*, HCW's new regular column designed to keep you in touch with everything going on in the world of adventures and arcade-adventures (arcadventures, as I call them). *Ventures* will also help you out if you are stuck or want to tell the world how brilliant you are at a certain point in a game. We need your letters so if you need help, can provide help, or simply want to express your opinion on the games covered in *Ventures*, write now!

In future issues I hope to be taking a look at specific new software releases, but up until now, here's an overview of some of the best games around, starting with adventures. Fortunately, many adventures are released on several machines, which makes it easier like this week easier to write.

Our company who does this is Melbourne House, who won the most famous British game of all, *The Hobbit*, which has been a best-seller, although personally I find a boring. Recently Sherlock Holmes also

Ventures

from Random, Valkyrie II, and the Best Adams' games. The Hulk, *Barbarian* of Clarendon Castle and *Adventures*.

Adventures are much newer and constantly improving. They open up like islands with Magic Maps, some of up with Jet Set Willy and are now much more popular and complex. *Robinson* will show that has proved popular, as has *Interceptor's* original *Tales Of The Arabian*

also wrote. In *Valkyrie*, the left hand numbers are locations. There are 33. The right hand numbers are where the map will take you. The object is to go to the following locations: Other 13, Dragon 37, Shiver 4, Snake 44, Poltergeist 4, Dragon 21. This would be very useful if only I could find the numbers. Maybe they are only on the CEM version?

The Hulk is proving very tricky to a lot of people. Kim

who would like to inform all *Robinson* Willy that proving 1 or 1 in the title screen of the game will take you to the program. Then stop. The object is the freedom of playing the *Robinson* games which almost escaped me.

N. What of *Harrogate* asks for help with about three of *Tales Of The Arabian Nights*. It seems as if *Democracy* thinks he can help, his solution would, however, take up the whole magazine, so here is just how to get the second 'A' which seems to be the problem. When standing by the ladder, wait for the gate to come into you, then jump off the edge so to the back wall. When the gate has passed, run and you drop off the back wall, jump left and come under the ladder. When the gate is very close, climb up, jump off the edge and there's your 'A' again.

John Williams is having problems with *Robin's* *Robbery* on the CEM. Well, you need to use the objects, which will either kill the monster, drop down equipment or open the door. Your enemy can be outplayed by standing on the ceiling.

Finally, some requests for help for which you might be able to provide solutions. Maurice Ashworth from Lancs is looking for a solution rather than a *Storage* *Delivery* on the TI 99/4A, whilst Michael Choudhury is stuck with a thingy scenario in *Richard Shephard's* *Super Spy*. Can anyone help?

So that's the first *Ventures* column. Remember, write to it if you are stuck, or have solved any type of problem, or simply want to express opinions. Mark your letters *Ventures* to save non-answering stuff being confused by dragons, and make sure you put your full name and address on your letters. Bye for now!



into the chess on two machines — dragons cause terrible frustration — as has the much better and funnier *Interceptor*.

Level 9 prodigies has well known but brilliant, large, vividly priced and atmospheric adventures, including a version of the original *Interceptor* game. Other personal offerings include the *Amiga* A-G range, all at low prices, *Baggy's* *Time* *Kingdoms* *Valkyrie*, a new game

Night and day not to original *Clara* *Home*.

Melbourne House entered the field with *Dr. Lancelot* to did *Mercurius* with *Brave* *Bluff* and the complicated *Jupiter*. By far the best of this genre, however, is *Pyromaniac* by *MicroGna*, which really combines arcade elements with the problem solving strategy of adventures.

There are many new adventures/adventures being released in the run up to Christmas, and I hope to look at these in future issues.

Now for this week's help. As I said, we really need your letters — it's difficult to work without them, but here's a selection from the HCW postbag. I have not noted solutions (yet) that there are many this week) and will not do so unless you request me to do so.

Firstly, I'm *Randy* of *Allen*



Valkyrie at *Robinson* *Robbery* (there). Here are some general hints, but I'm afraid I am one of the many who are stuck on those ants. There are many doors, each different inside. *Dr. Lancelot* is in one, but will only appear to the Hulk. Sometimes he is there, but at other times he might show you something worth further examination... I would be interested to hear from anyone who has further solutions with this popular game.

Kim Vidal also asks about how to open the door in the tower in the fifth world in *Richard Shephard's* *Software's* *Intercept*. Any ideas, anyone?

Moving on to *Interceptors*, Tony Cox writes from London to give hints on *Mercurius*. Apparently pressing *CTRL* and any key from A to colon will allow you to access any of the screens. A similar hint comes from James Collis of Bedford,



Baffled by jargon? Confused by terminology? Dave Carlos leads you gently into the world of the machine code programmer and points you on your way

If you want to communicate with other people for some reason, you need to understand their language, or communication is difficult to say the least. If you've stepped off the usual tourist track, where on holiday, you will have found difficulty in communicating and may well find difficulty to write letters and poems in your language. This can work, but what would happen if the person you were speaking to was deaf?

We have the same sort of problems in communications with computers, since they "speak" a language completely different to our own and this makes the interchange of information between us quite difficult. In order to give us any change at all, the designers of our machines "taught" them to speak a language we can learn reasonably easily, called BASIC (short for Beginner's All-Purpose Symbolic Instructional Code).

This is done by placing in the machine a special type of program called an interpreter which works like the interpreters you use in the United Nations. It takes the language you give the machine, probably by typing at the keyboard, and interprets each part, turning it into machine language or machine code as it is often known. This computer is a mixture of electrical signals at different levels, off and on, as you might say, which have particular meanings for the type of processor you are using.

As you might have guessed, interpreting costs the UK lots of money because it takes so much time. Whilst it doesn't cost so much, it still takes a great deal of computer time, so every word is translated each time it is found, no matter how many times a particular word crops up in a program.

It's rather like using a

French/English dictionary for every word, even learning over a few common words. It would save us all this time if we could only speak the same language as the machine in the first place. Unfortunately it would be very difficult for us to input electrical signals direct to the machine, so a series of intermediate stages are necessary.

This is where we start to see the need for binary numbers in a computer. These numbers can be changed very quickly into a series of on and off, because their only numbers to a single on or off signal. This means we could program our machine by inputting a number of on and off, and since that it would take us some time to input a large program, what happens if you make even a single mistake?

To help us further, we group

these binary numbers into bits (because 10 will divide exactly by two and 10 won't) and call these numbers hexadecimal numbers. These are often mistakenly referred to as machine code, they aren't real, proper machine code because they aren't electrical signals but they are very easily translated into such signals and this makes them ideal for our use. All we need to do now is have a single series of hexadecimal numbers and the task is done.

Not the easiest of problems, I'm sure you'll agree. Fancy having the least the meaning of up to 155 different numbers and then write them down in order to make the computer do anything. No, to make the whole operation a little simpler, some of the early programmers developed a series of instructions, or memory aids, or

reminds as of the meanings of the numbers.

You probably used a mnemonic at school to remember the names of the colours of the rainbow — Richard Of York Gave Battle In Vain. This system was successful and much easier to learn than the series of numbers and so programmers started to use a series of look-up tables where the programmer was faced along with an number equivalent.

Some bright sparks got fed up of this and one day decided to write a program, or macrocode of sorts, which would be able to translate straight from macrocode to hexadecimal numbers without having to look up the values in between. He did this and called the program an "assembler" because it took the macrocode and assembled



the hexadecimal numbers with the necessary action into a working program.

Using an assembler is how most people, nowadays, write machine code. Assembler programs are much easier to learn than the numbers themselves because they have some meaning, and psychologists believe that it is meaningful groups that we store information in the brain. At last we have a simple way of making the machine do what we want without having to make it interpret our language on each occasion.

So, if you still want to write machine code, or to be more exact, assembler, how do you go about it? Firstly, you need to find out what type of processor there is inside your machine. This is because the "instructions are", in the land of words, the processor can take, differ from processor to processor and therefore the machine instructions change too. The common processors are 6801 (BBC, Electron, Commodore, C64/Amiga) and 6802 (Spectrum, Amstrad, Tandy) but there are a number of others, e.g. 6809 in the Dragon.

Once you have done this you should look for three main things. Firstly, you need an assembler and a disassembler (which helps you get your instructions with as many features as possible). The types available differ greatly from machine to machine, so pass assembly is vital but if possible also get one with a "macro" facility. BBC and Electron owners really only need a disassembler as no assembler is built into the BASIC in those machines.

Secondly, you should buy a good book on learning machine code for your particular machine as information varies from machine to machine, such as the location of the ports and the memory that for your program. These books will probably tell you all you need to know. Finally, you should consider buying one of the manuals for the particular processor: your machine manual. This isn't essential, but if you are serious it can help explain the various instructions in full detail.

When you've got all these things together you could start to read and see what you've learned. Machine code isn't easy but it does have its rewards, and it's difficult to stop yourself running around the house when you've got a letter on the screen for the very first time. What you then realize is the amount of work the BASIC interpreter does when

you tell it to "PRINT "A"."

You need to remember that after the assembler has "compiled" your program, it must be saved separately to the assembly program, or "source code", from which it came. This is because the new program, a series of numbers, can now be run without the assembler. You LOAD the program and CALL it from the machine and it starts its mission.

It is this way of avoiding any intermediaries that makes machine code so fast. You do need to be meticulous about file naming though, since it is very easy to have a new compiled program over your source code, only to find that there is a mistake in the program and you have to start again from scratch. If you'd been more careful you could have just looked at the source code again and a minor alteration would have provided the solution.

One major idea must be considered in this introduction — the concept of language level. The reason BASIC is easy to learn is because it is a high level language. This is defined as computing codes in a language in which one instruction can be translated into more than one machine language instruction.

The word PRINT, for example, needs the computer to take a whole range of actions in order for anything to appear on the screen. It involves finding out what to print, where the screen is, finding it in memory, putting the information in the right place and then returning to see what the next instruction is. All this happens because you used the one word PRINT.

Assembler is known as a low level language because a single instruction in the language is turned into a single action for the processor. As an example, the instruction "LD B 0" is often for Load the Accumulator with the value of 0. Notice that only one action is taken for the word. The accumulator becomes 0 and then the machine goes on to the next instruction.

This difference in level between assembler and BASIC means you must know much more about the range of macro instructions (GOTO) if you are to program in assembler than if you are content to use just BASIC. Your reward is very fast programs which can be made to do more than BASIC programs, because everything is written for a single purpose and not for a whole range.

You might picture a machine code program as a fairly

developed Formula One racing car. Built for the job and with just one purpose — speed. However, it can't be used like a production saloon car for a whole range of purposes,

including racing. Here the speed is sacrificed in order to be able to have a generally more useful vehicle. This wouldn't take your granny to the sea-side in a Mini Ford!



[illegible]

A rat was trapped from its cage and you have been given the task of finding it.

It is reported to be hiding somewhere on the 10 x 8 grid displayed on the board.

You have just five attempts to locate it by sending a pointer robot to a given square. If it is not at that location, you will be told the compass direction you need to go in to find it.

Notes

1 The coordinates will only be accepted if the computer is in the form letter number e.g. A1.

2 The program will attempt to help children learn about compass directions and you may find this increases the value of 2% in line 50 (in past years' issues).

Made in Germany

A note to make complete to convert this program to run on other machines. Request study of the expanded BASIC available on Amstrad BASIC too good. The following lines should help.

1 LOWERCASE converts all into lower case
2 END when the robot is released in the colour palette

```
10 REM % when the Rat is
20 REM % a game for the Amstrad CPC 464 %
30 REM % Steve Lucas July 1988 %
40 RANDOMISE TIMER: REM set random number generator to r-
  andom start
50 REM: REM after this number is null number of three
  zero zero
100 REM: REM
110 REM: REM
120 REM: REM
130 REM: REM
140 REM: REM
150 REM: REM
160 REM: REM
170 REM: REM
180 REM: REM
190 REM: REM
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960 REM: REM
970 REM: REM
980 REM: REM
990 REM: REM
```

How it works

```
50 an random number generator
to random start
40-50: randomize
50-60: define characters
60-70: draw board
70-80: REM
80-90: main control loop
90-100: loop game, display
100-110: REM
110-120: define windows
120-130: read location
140-150: REM
160-170: REM
```

Variables

```
100-110: location of rat
120-130: your guess
140-150: points earned
160-170: points characters
180-190: graphics for board
```

Keywords to BASIC or BASIC

1 FROM PAPER are used to select the foreground and background colours

2 PRINT is used to send primary into the last window defined in number 2

3 WINDOW is used to define new windows. Other defined windows are used in this program. Window 1 = lower right hand side (where robot is displayed) and Window 2 = map view hand only

4 The WHILE WEND loop will end to be replaced with a REPEAT UNTIL loop or simply a conditional GOTO (remembering that the condition is a WHILE WEND loop is based on the beginning, unless a REPEAT UNTIL loop)

5 DRAW is a command that from various in graphics output points to location A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 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991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

6 The space bar is used to move the robot to the next square.

7 The space bar is used to move the robot to the next square.

8 The space bar is used to move the robot to the next square.

9 The space bar is used to move the robot to the next square.

10 The space bar is used to move the robot to the next square.

11 The space bar is used to move the robot to the next square.

12 The space bar is used to move the robot to the next square.

13 The space bar is used to move the robot to the next square.

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980 REM: REM
990 REM: REM
```

You'll need to know the points of the compass and find your regular Steve Lucas. Track down that rampant rodent

[illegible]

1478 PRATT STREET, PRATT GROVE IN PRATT by James H. L.
 1479 JULY 1988
 1480 PRATT STREET, PRATT GROVE IN PRATT had two residents at
 1481 the time these items were taken from the house.
 1482 1478 PRATT ST. in the building destroyed on the 1988 earthquake
 1483 is in the middle of the morning. Two items only. 4th floor
 1484 in the middle of the morning.

10000 10.0
 10000 100000
 10000 1000000
 10000 10000000
 10000 100000000
 10000 1000000000

[illegible]

1998-1999: 17, 2000-2001: 17, 2002-2003: 17, 2004-2005: 17, 2006-2007: 17, 2008-2009: 17, 2010-2011: 17, 2012-2013: 17, 2014-2015: 17, 2016-2017: 17, 2018-2019: 17, 2020-2021: 17, 2022-2023: 17, 2024-2025: 17, 2026-2027: 17, 2028-2029: 17, 2030-2031: 17, 2032-2033: 17, 2034-2035: 17, 2036-2037: 17, 2038-2039: 17, 2040-2041: 17, 2042-2043: 17, 2044-2045: 17, 2046-2047: 17, 2048-2049: 17, 2050-2051: 17, 2052-2053: 17, 2054-2055: 17, 2056-2057: 17, 2058-2059: 17, 2060-2061: 17, 2062-2063: 17, 2064-2065: 17, 2066-2067: 17, 2068-2069: 17, 2070-2071: 17, 2072-2073: 17, 2074-2075: 17, 2076-2077: 17, 2078-2079: 17, 2080-2081: 17, 2082-2083: 17, 2084-2085: 17, 2086-2087: 17, 2088-2089: 17, 2090-2091: 17, 2092-2093: 17, 2094-2095: 17, 2096-2097: 17, 2098-2099: 17, 2100-2101: 17, 2102-2103: 17, 2104-2105: 17, 2106-2107: 17, 2108-2109: 17, 2110-2111: 17, 2112-2113: 17, 2114-2115: 17, 2116-2117: 17, 2118-2119: 17, 2120-2121: 17, 2122-2123: 17, 2124-2125: 17, 2126-2127: 17, 2128-2129: 17, 2130-2131: 17, 2132-2133: 17, 2134-2135: 17, 2136-2137: 17, 2138-2139: 17, 2140-2141: 17, 2142-2143: 17, 2144-2145: 17, 2146-2147: 17, 2148-2149: 17, 2150-2151: 17, 2152-2153: 17, 2154-2155: 17, 2156-2157: 17, 2158-2159: 17, 2160-2161: 17, 2162-2163: 17, 2164-2165: 17, 2166-2167: 17, 2168-2169: 17, 2170-2171: 17, 2172-2173: 17, 2174-2175: 17, 2176-2177: 17, 2178-2179: 17, 2180-2181: 17, 2182-2183: 17, 2184-2185: 17, 2186-2187: 17, 2188-2189: 17, 2190-2191: 17, 2192-2193: 17, 2194-2195: 17, 2196-2197: 17, 2198-2199: 17, 2200-2201: 17, 2202-2203: 17, 2204-2205: 17, 2206-2207: 17, 2208-2209: 17, 2210-2211: 17, 2212-2213: 17, 2214-2215: 17, 2216-2217: 17, 2218-2219: 17, 2220-2221: 17, 2222-2223: 17, 2224-2225: 17, 2226-2227: 17, 2228-2229: 17, 2230-2231: 17, 2232-2233: 17, 2234-2235: 17, 2236-2237: 17, 2238-2239: 17, 2240-2241: 17, 2242-2243: 17, 2244-2245: 17, 2246-2247: 17, 2248-2249: 17, 2250-2251: 17, 2252-2253: 17, 2254-2255: 17, 2256-2257: 17, 2258-2259: 17, 2260-2261: 17, 2262-2263: 17, 2264-2265: 17, 2266-2267: 17, 2268-2269: 17, 2270-2271: 17, 2272-2273: 17, 2274-2275: 17, 2276-2277: 17, 2278-2279: 17, 2280-2281: 17, 2282-2283: 17, 2284-2285: 17, 2286-2287: 17, 2288-2289: 17, 2290-2291: 17, 2292-2293: 17, 2294-2295: 17, 2296-2297: 17, 2298-2299: 17, 2300-2301: 17, 2302-2303: 17, 2304-2305: 17, 2306-2307: 17, 2308-2309: 17, 2310-2311: 17, 2312-2313: 17, 2314-2315: 17, 2316-2317: 17, 2318-2319: 17, 2320-2321: 17, 2322-2323: 17, 2324-2325: 17, 2326-2327: 17, 2328-2329: 17, 2330-2331: 17, 2332-2333: 17, 2334-2335: 17, 2336-2337: 17, 2338-2339: 17, 2340-2341: 17, 2342-2343: 17, 2344-2345: 17, 2346-2347: 17, 2348-2349: 17, 2350-2351: 17, 2352-2353: 17, 2354-2355: 17, 2356-2357: 17, 2358-2359: 17, 2360-2361: 17, 2362-2363: 17, 2364-2365: 17, 2366-2367: 17, 2368-2369: 17, 2370-2371: 17, 2372-2373: 17, 2374-2375: 17, 2376-2377: 17, 2378-2379: 17, 2380-2381: 17, 2382-2383: 17, 2384-2385: 17, 2386-2387: 17, 2388-2389: 17, 2390-2391: 17, 2392-2393: 17, 2394-2395: 17, 2396-2397: 17, 2398-2399: 17, 2400-2401: 17, 2402-2403: 17, 2404-2405: 17, 2406-2407: 17, 2408-2409: 17, 2410-2411: 17, 2412-2413: 17, 2414-2415: 17, 2416-2417: 17, 2418-2419: 17, 2420-2421: 17, 2422-2423: 17, 2424-2425: 17, 2426-2427: 17, 2428-2429: 17, 2430-2431: 17, 2432-2433: 17, 2434-2435: 17, 2436-2437: 17, 2438-2439: 17, 2440-2441: 17, 2442-2443: 17, 2444-2445: 17, 2446-2447: 17, 2448-2449: 17, 2450-2451: 17, 2452-2453: 17, 2454-2455: 17, 2456-2457: 17, 2458-2459: 17, 2460-2461: 17, 2462-2463: 17, 2464-2465: 17, 2466-2467: 17, 2468-2469: 17, 2470-2471: 17, 2472-2473: 17, 2474-2475: 17, 2476-2477: 17, 2478-2479: 17, 2480-2481: 17, 2482-2483: 17, 2484-2485: 17, 2486-2487: 17, 2488-2489: 17, 2490-2491: 17, 2492-2493: 17, 2494-2495: 17, 2496-2497: 17, 2498-2499: 17, 2500-2501: 17, 2502-2503: 17, 2504-2505: 17, 2506-2507: 17, 2508-2509: 17, 2510-2511: 17, 2512-2513: 17, 2514-2515: 17, 2516-2517: 17, 2518-2519: 17, 2520-2521: 17, 2522-2523: 17, 2524-2525: 17, 2526-2527: 17, 2528-2529: 17, 2530-2531: 17, 2532-2533: 17, 2534-2535: 17, 2536-2537: 17, 2538-2539: 17, 2540-2541: 17, 2542-2543: 17,

1970 **SAFARI** 2

100-443887-1000

NAME: _____

He squares you with his search, with his subjects on the far
 side. Later, when he

[illegible]

APRIL 1986

1310 20-1000000 IF 2000000 1310

1100 1000000 0

[illegible]

PARTE II

1370 IF $\text{J} = 1$ OR $\text{J} = 2$ OR $\text{J} = 3$ OR $\text{J} = 4$ THEN GOTO 1380

Figure 1

[illegible]

Figure 1

1470 3P 00-00 ON 00-00 ON 00-00 ON 00-00 THEN PAPER IS BLUE

1. **NAME** _____
 2. **DATE** _____
 3. **TIME** _____

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ALL SHIP PRODUCTS

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Spectrum**

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**David Rees,
leads you
through the
first steps of
understanding
Commodore
BASIC. It's
simply logical**

Logical thought

Logic commands form a very important part of BASIC, as they are indispensable in a few variety of ways, and make your BASIC commands (e.g. IF/THEN) more versatile.

The first hurdle to overcome is to understand what these commands do. AND and OR are the most commonly used logic commands, and their operation can be seen in the circuit in Fig. 1 if the two switches represent the input bits, with the light representing the result.

In the first circuit, either one switch OR the other can be closed to light the lamp. In the second circuit, both the first switch AND the second have to be closed to light the lamp.

In mathematics, if one bit OR the other bit is the true number is one, the result will be an on bit, e.g.

10 OR 6 = 1008 OR 0110 = 1110 = 14

Alternatively, only if one bit AND the other bit is on will the resulting bit be on, e.g.

12 AND 6 = 1100 AND 0110 = 0100 = 4

In decision commands such as IF/THEN, statements will give results of a similar nature. Take the statement:

IF A=1 OR B=1 THEN END

The routine will end if A=1 OR B=1 OR when both of the statements are true. If an AND statement had replaced the OR statement, both A=1 AND B=1 would have to be true for the routine to end.

Another statement of Commodore BASIC is NOT. This can be used both as a command and as an operand to AND and OR. NOT reverses a number so an on bit becomes an off bit and vice versa. In an IF/THEN statement, a NOT statement gives the meaning 'Is this bit constant if the statement is not true?' For example:

IF NOT A=1 THEN PRINT A

will print A if A is not equal to one.

If the NOT command is executed after the AND or OR command, you can create two new logic commands, NAND and NOR, giving answers

completely opposite to those of the original commands.

The final command is less well known and is called XOR (exclusive OR) with its opposite EXOR (exclusive NOR). This is a rarely required command, and can only be found in machine code on Commodore machines. To use the command, POKE two figures into consecutive memory locations.

100,201,00,2,101,2,00

To operate the routine, POKE the two numbers to be EXOR'ed into locations 2 and 201, 200 is the start of the machine code and use POKE 121 to find the answer. Basically, when EXOR does it, it will be which is an otherwise as

Fig. 1

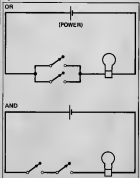
other combinations give off bits. Its greatest use is for flashing colours and algebraic (such as carry) without affecting the object itself.

Finally, logic may be used extensively in sprite control. Using AND and OR commands here in the sprite registers can be changed while leaving others static. For example, to set just the high 8 positions of sprite 3 on, use the following:

POKE 3104, PEEK (3104)
OR (2 - 3)

To mask the bit off, AND the number of every bit except the fourth bit:

POKE 3104, PEEK (3104)
AND (255 - 2 - 3)



PROGRAM

mean. This is preferable to carrying your computer with you in hand practices or live performances, if you're in a group, and as how I use the program.

The best way for you is get
into the program, and make

Other members of the family, however, will tolerate a much wider range of temperatures, and some will tolerate temperatures below 0°C.

Comparison is rather difficult as the backbone of the program is the ESD class, which is unique to the C++ class library.



```

100 rem b1a
1400 ng initba(1000) "python machine"
1410 pr initba(1000) "python machine" "python40,11
1450 rem b2acd
1500 pr initba(1000) 10 clear system"
1550 rem b2acd
1600 pr initba(1000) 01 define section"
1650 rem b2acd
1700 pr initba(1000) 00 define pattern"
1750 rem b2acd
1800 pr initba(1000) 40 skip predefined pattern"
2000 rem b1a- b2acd
2100 pr initba(1000) enter command (1-4) "inputa
2200 get clara(4)thengoto 1000
2300 gosub sub,1000,2000,4000
2400 goto 1000
2500 climen
1000 rem define section
1001 1
1040 rem clm- b2acd and
1050 pr initba(1000)section"loop" "loop"
1060 gosub sub,1000,2000,4000
1070 gosub sub,1000,2000,4000
1080 rem b2acd
1090 pr initba(1000) " " " "
1100 gosub sub,1000,2000,4000
1110 gosub sub,1000,2000,4000
1120 gosub sub,1000,2000,4000
1130 gosub sub,1000,2000,4000
1140 gosub sub,1000,2000,4000
1150 gosub sub,1000,2000,4000
1160 gosub sub,1000,2000,4000
1170 gosub sub,1000,2000,4000
1180 gosub sub,1000,2000,4000
1190 gosub sub,1000,2000,4000
1200 gosub sub,1000,2000,4000
1210 gosub sub,1000,2000,4000
1220 gosub sub,1000,2000,4000
1230 gosub sub,1000,2000,4000
1240 gosub sub,1000,2000,4000
1250 gosub sub,1000,2000,4000
1260 gosub sub,1000,2000,4000
1270 gosub sub,1000,2000,4000
1280 gosub sub,1000,2000,4000
1290 gosub sub,1000,2000,4000
1300 gosub sub,1000,2000,4000
1310 gosub sub,1000,2000,4000
1320 gosub sub,1000,2000,4000
1330 gosub sub,1000,2000,4000
1340 gosub sub,1000,2000,4000
1350 gosub sub,1000,2000,4000
1360 gosub sub,1000,2000,4000
1370 gosub sub,1000,2000,4000
1380 gosub sub,1000,2000,4000
1390 gosub sub,1000,2000,4000
1400 gosub sub,1000,2000,4000
1410 gosub sub,1000,2000,4000
1420 gosub sub,1000,2000,4000
1430 gosub sub,1000,2000,4000
1440 gosub sub,1000,2000,4000
1450 gosub sub,1000,2000,4000
1460 gosub sub,1000,2000,4000
1470 gosub sub,1000,2000,4000
1480 gosub sub,1000,2000,4000
1490 gosub sub,1000,2000,4000
1500 gosub sub,1000,2000,4000
1510 gosub sub,1000,2000,4000
1520 gosub sub,1000,2000,4000
1530 gosub sub,1000,2000,4000
1540 gosub sub,1000,2000,4000
1550 gosub sub,1000,2000,4000
1560 gosub sub,1000,2000,4000
1570 gosub sub,1000,2000,4000
1580 gosub sub,1000,2000,4000
1590 gosub sub,1000,2000,4000
1600 gosub sub,1000,2000,4000
1610 gosub sub,1000,2000,4000
1620 gosub sub,1000,2000,4000
1630 gosub sub,1000,2000,4000
1640 gosub sub,1000,2000,4000
1650 gosub sub,1000,2000,4000
1660 gosub sub,1000,2000,4000
1670 gosub sub,1000,2000,4000
1680 gosub sub,1000,2000,4000
1690 gosub sub,1000,2000,4000
1700 gosub sub,1000,2000,4000
1710 gosub sub,1000,2000,4000
1720 gosub sub,1000,2000,4000
1730 gosub sub,1000,2000,4000
1740 gosub sub,1000,2000,4000
1750 gosub sub,1000,2000,4000
1760 gosub sub,1000,2000,4000
1770 gosub sub,1000,2000,4000
1780 gosub sub,1000,2000,4000
1790 gosub sub,1000,2000,4000
1800 gosub sub,1000,2000,4000
1810 gosub sub,1000,2000,4000
1820 gosub sub,1000,2000,4000
1830 gosub sub,1000,2000,4000
1840 gosub sub,1000,2000,4000
1850 gosub sub,1000,2000,4000
1860 gosub sub,1000,2000,4000
1870 gosub sub,1000,2000,4000
1880 gosub sub,1000,2000,4000
1890 gosub sub,1000,2000,4000
1900 gosub sub,1000,2000,4000
1910 gosub sub,1000,2000,4000
1920 gosub sub,1000,2000,4000
1930 gosub sub,1000,2000,4000
1940 gosub sub,1000,2000,4000
1950 gosub sub,1000,2000,4000
1960 gosub sub,1000,2000,4000
1970 gosub sub,1000,2000,4000
1980 gosub sub,1000,2000,4000
1990 gosub sub,1000,2000,4000
2000 gosub sub,1000,2000,4000

```


Up and Addem CBM 64 £9.95

Peter-Peter Learning Software,
St John's Hill, Leicester LE5 4EB

Peter-Peter here for many years has a reputation for selling quality toys at a reasonable price. Now they are releasing the software market with four educational packages.

It aims to teach children up to six with a variety of dancing animals. There are four levels of difficulty. In the first the child holds a number and guides an animal to the ballroom depending on the number. If the child is correct the ballroom lights the robot, background in program, up into the clouds and part of a window will appear. The child continues until there is a

complete sentence. The robot then dances for joy. The fourth level has simple sums and the same window feature.

This is a very good program, it's delightful graphics and music kept the four-year-old entertained for some time and helped him learn. It's well worth looking at. It needs a joystick.

M.W.

Instructions	80%
graphics	90%
cost of use	90%
value for money	90%



Time Trucker CBM 64 £7.95

ADM, London Ho, 43 Upper
Colindale Rd, London NW9

This game has the advantage of being educational as well as being fun. You are a truck driver collecting produce from farms and delivering it to a depot.

There are three difficulty levels on the screen. In the first you log your arrival time displayed on the screen by means of an analogue clock, on to a digital display. Once this the box put up your order. A computer order at the depot sums a bonus.

In the second you don't have to log in but the farms open and close at certain times and you plan your route accordingly.

The third has the approximation that the first only opens for 10 minutes periods.

You choose from three levels of difficulty. In the first you add the time in the booklet, second has a money map and the third has road blocks on the money map.

Overall this is a good package accompanying time while waiting with an interesting game. As a teacher and parent, I think this is a game well worth a look. It needs a joystick.

DAW

Instructions	90%
graphics	90%
cost of use	90%
value for money	90%



Number Tumbler CBM 64 £9.95

Peter-Peter Learning Software,
St John's Hill, East St, Leicester LE5 4EB

This is an example of Peter-Peter's usual bang into the software market. It's a mathematics based game aimed at the child in 10 years but adults can think will probably be attractive to older ones too, even adults.

It's knowledge based and is easy to plug into the computer and use in a reasonably loaded rooming from 1000 to 1000.

The game opens with a computer screen against a page through which you can see many of the game's pictures, including an option to play without screen against an opponent at the computer. You must also decide whether to use + and - or * and / in combination of it. Then decide on your speed and whether the product of your answers will be two, three, four or five. The digit number and you are ready to play.

The aim is to become around a goal using the numbers shown with the calculator sign in a chain use of a series of the pre-determined numbers. It's a game of fast and furious fun and quick thinking. I have found it to be highly addictive.

It needs a joystick.

M.W.

Instructions	80%
graphics	80%
cost of use	90%
value for money	90%



Boffin bonanza

A page full of educational
programs. Read on to find out
the quality of the latest in
educational software

Know Your Own Pal-o BSC £ 9.95

If you have ever imagined yourself in a classroom, you may be inspired to find out exactly what school powers you have. This package lets you see just how Pal-o-Bonny does a range of tests.

The program is a fairly detailed personality quiz, to assess your "academic potential". This must be completed before entering on the five games which contain your ability. Each game consists of guessing the position of a hidden object, or guessing what is colours of playing cards.

You may control the number of games, but generally the more games the more accurate your rating is. You may also choose between the type of BSC (read as: classification or

percentage, which determines when the computer places an object, before or after your guess). Also included is a relaxation exercise to help you "get in the mood", and you have the option of saving your data for long-term saving.

Whether or not you believe in parapsychology or not, this program is well written and presented, and in my opinion well worth trying if you are at all conversant with B.S.C.

Instructions	90%
graphics	80%
cost of use	90%
value for money	90%



Flashcards and Spelling CBM 64 £4.50

Toddlerhood 1 Col Long Centre
Leicester, LE5 0DT 065

Learning to read is one of the most important things we learn. Without this acquisition many others would be denied. You would not be able to decipher the words on this page and the program would be lost to you.

The program is easy to use and a simple voice display on each screen to read it well. Many parents and teachers have used the Flashcard technique to teach specific words about the house or as part of the bedtime routine. In reading a first book. This program takes the same approach and uses the computer to add a new dimension.

There are three main parts: alphabet learning, spelling and the Flashcard program. The words used fall into four categories. Baby's first words, words for toddlers, colours and words from the pre-writing British words. When the Flashcard opens it shows a word or phrase on the screen and to help the young reader the word is displayed with a various type moving picture and afterwards sound. This program is simple but can lead on to greater things. My son was soon telling me tales of porcupine, island and lightning. Great words to play the game together.

Instructions	90%
graphics	80%
cost of use	90%
value for money	90%



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PROGRAM

```

1000  DEF FN SQR(X)=SQR(X)
1010  DEF FN ABS(X)=ABS(X)
1020  DEF FN INT(X)=INT(X)
1030  DEF FN FLOOR(X)=FLOOR(X)
1040  DEF FN CEILING(X)=CEILING(X)
1050  DEF FN ROUND(X)=ROUND(X)
1060  DEF FN TRUNC(X)=TRUNC(X)
1070  DEF FN SIGN(X)=SIGN(X)
1080  DEF FN LOG(X)=LOG(X)
1090  DEF LN(X)=LN(X)
1100  DEF EXP(X)=EXP(X)
1110  DEF SIN(X)=SIN(X)
1120  DEF COS(X)=COS(X)
1130  DEF TAN(X)=TAN(X)
1140  DEF ATN(X)=ATN(X)
1150  DEF ARCTAN(X)=ARCTAN(X)
1160  DEF ASIN(X)=ASIN(X)
1170  DEF ACOS(X)=ACOS(X)
1180  DEF ATAN2(Y,X)=ATAN2(Y,X)
1190  DEF LOG10(X)=LOG10(X)
1200  DEF EXP10(X)=EXP10(X)
1210  DEF INT10(X)=INT10(X)
1220  DEF FLOOR10(X)=FLOOR10(X)
1230  DEF CEILING10(X)=CEILING10(X)
1240  DEF ROUND10(X)=ROUND10(X)
1250  DEF TRUNC10(X)=TRUNC10(X)
1260  DEF SIGN10(X)=SIGN10(X)
1270  DEF LOG10E(X)=LOG10E(X)
1280  DEF EXP10E(X)=EXP10E(X)
1290  DEF INT10E(X)=INT10E(X)
1300  DEF FLOOR10E(X)=FLOOR10E(X)
1310  DEF CEILING10E(X)=CEILING10E(X)
1320  DEF ROUND10E(X)=ROUND10E(X)
1330  DEF TRUNC10E(X)=TRUNC10E(X)
1340  DEF SIGN10E(X)=SIGN10E(X)
1350  DEF LOG2(X)=LOG2(X)
1360  DEF EXP2(X)=EXP2(X)
1370  DEF INT2(X)=INT2(X)
1380  DEF FLOOR2(X)=FLOOR2(X)
1390  DEF CEILING2(X)=CEILING2(X)
1400  DEF ROUND2(X)=ROUND2(X)
1410  DEF TRUNC2(X)=TRUNC2(X)
1420  DEF SIGN2(X)=SIGN2(X)
1430  DEF LOG4(X)=LOG4(X)
1440  DEF EXP4(X)=EXP4(X)
1450  DEF INT4(X)=INT4(X)
1460  DEF FLOOR4(X)=FLOOR4(X)
1470  DEF CEILING4(X)=CEILING4(X)
1480  DEF ROUND4(X)=ROUND4(X)
1490  DEF TRUNC4(X)=TRUNC4(X)
1500  DEF SIGN4(X)=SIGN4(X)
1510  DEF LOG8(X)=LOG8(X)
1520  DEF EXP8(X)=EXP8(X)
1530  DEF INT8(X)=INT8(X)
1540  DEF FLOOR8(X)=FLOOR8(X)
1550  DEF CEILING8(X)=CEILING8(X)
1560  DEF ROUND8(X)=ROUND8(X)
1570  DEF TRUNC8(X)=TRUNC8(X)
1580  DEF SIGN8(X)=SIGN8(X)
1590  DEF LOG16(X)=LOG16(X)
1600  DEF EXP16(X)=EXP16(X)
1610  DEF INT16(X)=INT16(X)
1620  DEF FLOOR16(X)=FLOOR16(X)
1630  DEF CEILING16(X)=CEILING16(X)
1640  DEF ROUND16(X)=ROUND16(X)
1650  DEF TRUNC16(X)=TRUNC16(X)
1660  DEF SIGN16(X)=SIGN16(X)
1670  DEF LOG32(X)=LOG32(X)
1680  DEF EXP32(X)=EXP32(X)
1690  DEF INT32(X)=INT32(X)
1700  DEF FLOOR32(X)=FLOOR32(X)
1710  DEF CEILING32(X)=CEILING32(X)
1720  DEF ROUND32(X)=ROUND32(X)
1730  DEF TRUNC32(X)=TRUNC32(X)
1740  DEF SIGN32(X)=SIGN32(X)
1750  DEF LOG64(X)=LOG64(X)
1760  DEF EXP64(X)=EXP64(X)
1770  DEF INT64(X)=INT64(X)
1780  DEF FLOOR64(X)=FLOOR64(X)
1790  DEF CEILING64(X)=CEILING64(X)
1800  DEF ROUND64(X)=ROUND64(X)
1810  DEF TRUNC64(X)=TRUNC64(X)
1820  DEF SIGN64(X)=SIGN64(X)
1830  DEF LOG128(X)=LOG128(X)
1840  DEF EXP128(X)=EXP128(X)
1850  DEF INT128(X)=INT128(X)
1860  DEF FLOOR128(X)=FLOOR128(X)
1870  DEF CEILING128(X)=CEILING128(X)
1880  DEF ROUND128(X)=ROUND128(X)
1890  DEF TRUNC128(X)=TRUNC128(X)
1900  DEF SIGN128(X)=SIGN128(X)
1910  DEF LOG256(X)=LOG256(X)
1920  DEF EXP256(X)=EXP256(X)
1930  DEF INT256(X)=INT256(X)
1940  DEF FLOOR256(X)=FLOOR256(X)
1950  DEF CEILING256(X)=CEILING256(X)
1960  DEF ROUND256(X)=ROUND256(X)
1970  DEF TRUNC256(X)=TRUNC256(X)
1980  DEF SIGN256(X)=SIGN256(X)
1990  DEF LOG512(X)=LOG512(X)
2000  DEF EXP512(X)=EXP512(X)
2010  DEF INT512(X)=INT512(X)
2020  DEF FLOOR512(X)=FLOOR512(X)
2030  DEF CEILING512(X)=CEILING512(X)
2040  DEF ROUND512(X)=ROUND512(X)
2050  DEF TRUNC512(X)=TRUNC512(X)
2060  DEF SIGN512(X)=SIGN512(X)
2070  DEF LOG1024(X)=LOG1024(X)
2080  DEF EXP1024(X)=EXP1024(X)
2090  DEF INT1024(X)=INT1024(X)
2100  DEF FLOOR1024(X)=FLOOR1024(X)
2110  DEF CEILING1024(X)=CEILING1024(X)
2120  DEF ROUND1024(X)=ROUND1024(X)
2130  DEF TRUNC1024(X)=TRUNC1024(X)
2140  DEF SIGN1024(X)=SIGN1024(X)
2150  DEF LOG2048(X)=LOG2048(X)
2160  DEF EXP2048(X)=EXP2048(X)
2170  DEF INT2048(X)=INT2048(X)
2180  DEF FLOOR2048(X)=FLOOR2048(X)
2190  DEF CEILING2048(X)=CEILING2048(X)
2200  DEF ROUND2048(X)=ROUND2048(X)
2210  DEF TRUNC2048(X)=TRUNC2048(X)
2220  DEF SIGN2048(X)=SIGN2048(X)
2230  DEF LOG4096(X)=LOG4096(X)
2240  DEF EXP4096(X)=EXP4096(X)
2250  DEF INT4096(X)=INT4096(X)
2260  DEF FLOOR4096(X)=FLOOR4096(X)
2270  DEF CEILING4096(X)=CEILING4096(X)
2280  DEF ROUND4096(X)=ROUND4096(X)
2290  DEF TRUNC4096(X)=TRUNC4096(X)
2300  DEF SIGN4096(X)=SIGN4096(X)
2310  DEF LOG8192(X)=LOG8192(X)
2320  DEF EXP8192(X)=EXP8192(X)
2330  DEF INT8192(X)=INT8192(X)
2340  DEF FLOOR8192(X)=FLOOR8192(X)
2350  DEF CEILING8192(X)=CEILING8192(X)
2360  DEF ROUND8192(X)=ROUND8192(X)
2370  DEF TRUNC8192(X)=TRUNC8192(X)
2380  DEF SIGN8192(X)=SIGN8192(X)
2390  DEF LOG16384(X)=LOG16384(X)
2400  DEF EXP16384(X)=EXP16384(X)
2410  DEF INT16384(X)=INT16384(X)
2420  DEF FLOOR16384(X)=FLOOR16384(X)
2430  DEF CEILING16384(X)=CEILING16384(X)
2440  DEF ROUND16384(X)=ROUND16384(X)
2450  DEF TRUNC16384(X)=TRUNC16384(X)
2460  DEF SIGN16384(X)=SIGN16384(X)
2470  DEF LOG32768(X)=LOG32768(X)
2480  DEF EXP32768(X)=EXP32768(X)
2490  DEF INT32768(X)=INT32768(X)
2500  DEF FLOOR32768(X)=FLOOR32768(X)
2510  DEF CEILING32768(X)=CEILING32768(X)
2520  DEF ROUND32768(X)=ROUND32768(X)
2530  DEF TRUNC32768(X)=TRUNC32768(X)
2540  DEF SIGN32768(X)=SIGN32768(X)
2550  DEF LOG65536(X)=LOG65536(X)
2560  DEF EXP65536(X)=EXP65536(X)
2570  DEF INT65536(X)=INT65536(X)
2580  DEF FLOOR65536(X)=FLOOR65536(X)
2590  DEF CEILING65536(X)=CEILING65536(X)
2600  DEF ROUND65536(X)=ROUND65536(X)
2610  DEF TRUNC65536(X)=TRUNC65536(X)
2620  DEF SIGN65536(X)=SIGN65536(X)
2630  DEF LOG131072(X)=LOG131072(X)
2640  DEF EXP131072(X)=EXP131072(X)
2650  DEF INT131072(X)=INT131072(X)
2660  DEF FLOOR131072(X)=FLOOR131072(X)
2670  DEF CEILING131072(X)=CEILING131072(X)
2680  DEF ROUND131072(X)=ROUND131072(X)
2690  DEF TRUNC131072(X)=TRUNC131072(X)
2700  DEF SIGN131072(X)=SIGN131072(X)
2710  DEF LOG262144(X)=LOG262144(X)
2720  DEF EXP262144(X)=EXP262144(X)
2730  DEF INT262144(X)=INT262144(X)
2740  DEF FLOOR262144(X)=FLOOR262144(X)
2750  DEF CEILING262144(X)=CEILING262144(X)
2760  DEF ROUND262144(X)=ROUND262144(X)
2770  DEF TRUNC262144(X)=TRUNC262144(X)
2780  DEF SIGN262144(X)=SIGN262144(X)
2790  DEF LOG524288(X)=LOG524288(X)
2800  DEF EXP524288(X)=EXP524288(X)
2810  DEF INT524288(X)=INT524288(X)
2820  DEF FLOOR524288(X)=FLOOR524288(X)
2830  DEF CEILING524288(X)=CEILING524288(X)
2840  DEF ROUND524288(X)=ROUND524288(X)
2850  DEF TRUNC524288(X)=TRUNC524288(X)
2860  DEF SIGN524288(X)=SIGN524288(X)
2870  DEF LOG1048576(X)=LOG1048576(X)
2880  DEF EXP1048576(X)=EXP1048576(X)
2890  DEF INT1048576(X)=INT1048576(X)
2900  DEF FLOOR1048576(X)=FLOOR1048576(X)
2910  DEF CEILING1048576(X)=CEILING1048576(X)
2920  DEF ROUND1048576(X)=ROUND1048576(X)
2930  DEF TRUNC1048576(X)=TRUNC1048576(X)
2940  DEF SIGN1048576(X)=SIGN1048576(X)
2950  DEF LOG2097152(X)=LOG2097152(X)
2960  DEF EXP2097152(X)=EXP2097152(X)
2970  DEF INT2097152(X)=INT2097152(X)
2980  DEF FLOOR2097152(X)=FLOOR2097152(X)
2990  DEF CEILING2097152(X)=CEILING2097152(X)
3000  DEF ROUND2097152(X)=ROUND2097152(X)
3010  DEF TRUNC2097152(X)=TRUNC2097152(X)
3020  DEF SIGN2097152(X)=SIGN2097152(X)
3030  DEF LOG4194304(X)=LOG4194304(X)
3040  DEF EXP4194304(X)=EXP4194304(X)
3050  DEF INT4194304(X)=INT4194304(X)
3060  DEF FLOOR4194304(X)=FLOOR4194304(X)
3070  DEF CEILING4194304(X)=CEILING4194304(X)
3080  DEF ROUND4194304(X)=ROUND4194304(X)
3090  DEF TRUNC4194304(X)=TRUNC4194304(X)
3100  DEF SIGN4194304(X)=SIGN4194304(X)
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```


SuperBASIC Commodore 64 £3.95

Century Communications, 12-11 Great St, London W1V 5LE

An everyday feature, the one nasty part of the 64 is the lack of commands for sound or graphics control. This has resulted in many software houses bringing an emulator to the rescue: BASIC. This emulator-based system offers 30 new commands, making life a little easier.

For audio leads into the free zone between the ROMs, and looks up leaving a full complement of 30K available. The next aspect of this package is then more where its resources (graphics) are used: you can have the full amount of RAM available? This means that the system's limit has the equivalent of the RAM built into the KERNAL for the high-resolution screen (symmetrically behind the KERNAL ROM).

The main commands can be split into four categories: File (or FILE), GETTING and programming aids. There are 10 commands including the usual SPIN, OPEN, AUTO, CLOSE, DURE, HIDE and so on. There is a standard subcommand without any syntax. It was pleased to see the BASIC64 did actually implement CDTOR's and CDTOR's.

Some 11 commands for the manipulation of graphics are provided: both in resolution and in colour modes are supported and commands are common to both. With that system you can give results, draw lines and draw filled blocks. All drawing actions can be performed with the two axes, using the two complete drawing systems used not to be on screen. Generally the graphics commands worked effectively. I was surprised to see the absence of CIRCLE and FILL. There is no reason why such useful commands should be omitted.

Probably the software job to perform on the 64 is the manipulation of sprites. Most operations involve the turning of a specific bit and you to make sprites. SuperBASIC provides an commands which deal with all aspects of sprites, including positioning on the screen, colour, priority and display. There is one, unfortunately, very help with design of sprites. The special method of DATA is presented as really a nuisance and I hoped to see some help. Similarly, colours are not covered for.

Finally we have sound. The seven commands cover the majority of areas such as frequency, wave form, timing, ADR, volume and there is a master command. The latter enables you to play tones directly rather than through the software frequency. Again supported, such as the Modulation, and volume control appear to have been ignored.

Sound and Vision

Detailed reviews of two really useful programs for the Commodore 64. Our experts give you the information you need

Overall, I got the impression that the authors have tackled most of the job but have stopped at 80% completion. If more was the position, they could have pushed 2 or 10% of BASIC to finish the job without too many hours of waiting from the power.

As a sample this is a far product which, at this price, is good value. The fact that you don't have any real BASIC is a slight bonus. A 9.

Instructions 80%
Program 100%
Cost of use 100%
Value for money 100%



Music Master CBM 64 £17.95

SuperSoft, 11 Manor Rd, Higham Hill, London E17 2BT

The latest manuscript from SuperSoft takes the form of a classic synthesis package. The hardware are quite extensive and allow you full control over the C64-64 sound.

A range of preset instruments are available to load in the program is loaded. You may change the preset definitions and save them for future use if required. They may be assigned to any of the three voices at the same time. You may also modify the preset parameters manually until the required sound is achieved.

Timing music is done using the period C64-64 keyboard which works in a similar manner to a piano type keyboard. Other control keys in the menu to control which control you are playing, the status you are in, current tempo etc.

You may set up a list of notes into any of the voices when it is loaded. There may also be played back simultaneously to create quite wonderful pieces of synthesized music. Unfortunately you may set a limit to play either a predefined or an infinite background tone.

The edit mode will allow you to delete, insert and change notes in your selected music. The editing facilities are very good and make the thought your music is extremely easy.

Before I received a copy of Music Master I could not believe how easy another or even read music. After some experimenting

and looking up a few of the basic properties in books I am now able to create quite quite extensive pieces of music. As an example a solo rock show is 10 hours to create. Good luck from Henry. Goodness as that is played in all three voices. I should imagine that with some more practice at reading music this will become much easier.

All notes and any defined program may be saved in a short list or file and viewed as a list and played again. The manual explains a method of using three control lines to play music in four programs. I would advise that this is left to Music Master because it seems quite complicated to reverse some of the features.

For those of you who like playing speed readers and reading word and for you

words there is a special effects screen. The manual explains on that but very expensive and most quite wonderful.

The manual is well written and seems to explain most of the program details quite well.

My remark was supposed to be: Loading manual is well perfectly explained although a little more for me. The manual explains a method of using three control lines to play music in four programs. I would advise that this is left to Music Master because it seems quite complicated to reverse some of the features.

Instructions 100%
Program 100%
Cost of use 100%
Value for money 100%



AGF Protocol 4 Spectrum £29.95

AGF Hardware, 24 Via Gogh Place, Ringer, Ruge, Wexham

If you have grown sick of looking for peripherals, then you will probably find that a joystick interface is a real treat. The question then becomes: which one? There are so many on the market that it would be easy to feel you are never going to be able to find the ideal one. This interface tries to overcome these problems by allowing you to decide which type of interface to have for each axis.

The design savings which has made this possible is a programmable card which can be set to give a response to almost any of the keys on the keyboard that have been pressed. These cards are made from black plastic and have to be fairly tricky and thick as they are powered down as in a single intensive session of the card.

Now on the card you will find the joystick to simulate by pushing little plastic pins on the card and then operating a card the interface card.

Flipping the page is quite simple once you have discovered which key sends a pin in return, hole. The answers are provided by the sheet on the card, each key requiring two pins to be inserted. As you can imagine, it would be very tedious having to remove and replace these pins every time you changed your mind on all you have to do is keep one card for your joystick. There are even provided on this the interface will simulate the joystick it is and with AGF, the joystick interface and keyboard, also one which said.

The system also supports other peripherals with the provision of another edge connector at the rear. Added up all this there is a great savings which is certainly close to power down but without the need to remove the plug that usually houses the joystick's power socket. Flipping the card is simple and done at very little chance of mistake, although

Extras to add on and make life easier

We've reviewed for you AGF's Joystick interface and Micro Power's BASIC Extensions ROM — read on to find out if they're value for money

It looks rather different on a Spectrum, with the legs in the down position. Programming the interface is very simple — the card is well coded and with all the possibilities it offers I cannot believe that the price is reasonable. This will be the answer to a number of game players' prayers.

BASIC Extensions ROM BBC £19.95

Micro Power, Hounslow for North St, Leeds LS2 1AA

If you're a beginner in structured programming, you will probably like the ease of BASIC which the ROM machine has to default. For the power programmer there are a number of structures which are constructed by data records. The ROM is an addition to the standard BASIC and language talks with it to give you a whole range of new "words". Some of these are useful to writing programming code, others seem to make BASIC even better and there are even a couple to help make program files more

the ROM/ROMS goes available EXTENSION type program. All good stuff, one to see and of great value for all those programmers, particularly those in education.

The programmer's interface includes the ability to insert any code to well as globally or selectively REPLACE existing. The strong one can access keywords and macros. There is a debugger program in some advanced windows. There is a program compiler to remove overheads, a 2000PT command to allow the naming around of lines in a program and variable ROM files, applies COME to make the a function command in that a better you to insert a program after an error at the time hasn't occurred.

The file system is YODRPT, to check that a program has been saved correctly, as provided for COME ADD, VIEW, which



footprint

The first set of words covers the core structures and give you the ability to

use WHILE/ENDWHILE loops for the first time. These loops are not always needed because the use for a continuing condition is in the ending of the loop, not in the middle as is the case with BASIC REPEAT/UNTIL, and FOLLOW/UNTIL loops.

There is also a GOTO implementation of the CALL statement which allows you to specify a whole range of macros to be used, if a single variable holds peripheral values or more of these specified in all two others. Slightly less useful structures are also provided a LOOP/UNTIL structure allows you to finish a loop as a program starting. An exception if it particular one is passed, which

allows a program to be read from ROM and then displayed on screen without altering the content of memory, and two others which make the program of the program to include very simple code, as well as 10 more commands.

This ROM is a real bonus to those who like to work with a good degree of accuracy but also provides utilities which any programmer will find useful. The design manual is well written and easy to follow with examples of the macros taken by each of the commands. Its only drawback is that a "macro" or code part of memory, the you must get everything for nothing.

Programs written using the extra commands can run by used by those within the ROM with a copy in the Basic ROM. Review which is available for you. It gives value of some. B.C.



PSYCHEDELIA

PSYCHEDELIA -

YOU CANNOT WIN
YOU CANNOT LOSE
ONLY ENJOY

PSYCHEDELIA —

THERE IS NO FRUSTRATION
THERE IS NO KILLING
ONLY PLEASURE!

PSYCHEDELIA -

SWITCH ON TO MUSIC
SWITCH ON IN THE DARK
ONLY SWITCH ON!

PSYCHEDELIA —



Lamasoft

ORIGINAL SOFTWARE DESIGN

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A L I E N



In space no one can hear you scream.



WARRIOR
She's brave and
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